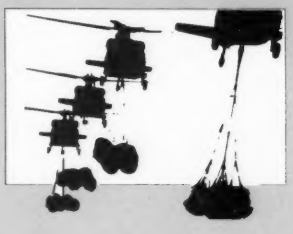
UNITED STATES ARMY

SEPTEMBER/OCTOBER 1990

AVIATION DIGEST

BATTLE COMMAND TRAINING PROGRAM

COMBAT MANEUVER TRAINING



REALISTIC

TOUGH

TRAINING

NATIONAL TRAINING CENTER

at the COMBAT TRAINING CENTERS

JOINT READINESS TRAINING CENTER

Professional Bulletin 1-90-5

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AVIATION DIGEST

PROFESSIONAL BULLETIN

1-90-5 • SEPTEMBER/OCTOBER 1990

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Chief, Army Aviation Branch

Tough, Realistic Training

THE DEMOCRATIZATION of Warsaw Pact countries in Eastern Europe fostered the belief that the cold war has ended and the threat to our National security is significantly diminished. Recent events in the Persian Gulf confirm that defending our National interests abroad remains a formidable task.

We are tasked to defend our National interests with smaller armed forces—forces that are tasked to respond rapidly to world crises with an effective global reach. Our Army is such a force: well trained and equipped, ready to deploy, fight and win in combat at any intensity level, anywhere, anytime.

Tough, realistic training is the means by which we develop our warfighting proficiency to exercise the combined arms capability required in battle. Multiechelon, totally integrated, combined arms training is continuously stressed at all levels. Our training philosophy focuses on wartime mission tasks to ensure we train the way we intend to fight.

Army Aviation starts with the individual soldier and builds upon that foundation. Our goal is to produce a technically and tactically proficient soldier. In aviation, resident training is the principal source of initial individual training. The soldier must demonstrate proficiency before graduation. Upon arrival at the new unit, the soldier is trained to attain and sustain proficiency in mission-oriented tasks selected by his commander.

Commanders focus training based on their wartime mission. This focus, which we call "battle focus," is used to develop the unit's mission training plan (MTP). Critical tasks are selected from the MTP to develop a mission essential task list (METL). In the near future, METL will be incorporated into the aviator's aircrew training manual (ATM), which effectively transforms individual aviator tasks into realistic crew and multiship tactical training. The improved ATM training program, coupled with realistic live fire gunnery training established in TC 1140, will enhance our future warfighting effectiveness.

Unit training and assessment are often accomplished collectively with other units at combat training centers (CTCs), such as the National Training Center, Ft. Irwin, CA. U.S. forces train in the California desert for the kind of fight we are facing right now in the Persian Gulf. Army Aviation brigade commanders conduct *tough, realistic training* on hot, open, sandy terrain against opposing forces in fast-moving scenarios that could occur for real in the Middle East now. Tactical training against an enemy that fights back is an effective way to ensure combat readiness.

Today, computer-driven simulation technology provides us with another source of opposing forces: automated forces that challenge the best tacticians. Simulation network (SIMNET) is such a system. The SIMNET combines close combat tactical trainers to allow soldiers in simulators to train with or against each other on the same computerized battlefield. The aviation combined arms tactical trainer (AVCATT), an extension of SIMNET, will provide an unrestricted, fully integrated battlefield. AVCATT permits complete interaction with other members of the combined arms team, providing a realistic command and control management scenario to fight the AirLand Battle.

Army Aviation is training tougher and safer than ever before while operating sophisticated aircraft in a high-risk environment. Conducting this kind of training at night under night vision goggles (NVG) further increases our combat effectiveness. Using NVG proved to be the key factor in accident-free combat night operations in Panama—proof that *tough, realistic training* pays off. It was a clear case of picking the force most suited for the mission—the U.S. Army! Success didn't just happen—our soldiers *trained for success*!

Aviation Lessons Learned at the

Combat Training Centers

This article shares some key lessons learned by aviation units during fiscal year 1990 combat training center (CTC) rotations. These lessons are a collection of heavy force, light force and contingency operations; some are emerging doctrinal concepts, which are not incorporated into doctrinal manuals. Many are not new but continue to reappear.

Captain (P) Shane M. Deverill and Captain Michael S. Marlow

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Each training center offers unique training opportunities for aviation units. The *National Training Center* (NTC), Ft. Irwin, CA, provides brigade-sized task force (TF) training in mid-to-high intensity conflicts. Having the largest maneuver area of the CTCs, the NTC enables units to train force-on-force and live fire.

The *Joint Readiness Training Center (JRTC)*, Ft. Chaffee, AR, offers light forces a realistic training opportunity in low-to-mid intensity conflicts and integration with the U.S. Air Force.

Located at Hohenfels, West Germany, is the *Combat Maneuver Training Center*. This center provides U.S. Army, Europe an experience like the NTC.

Headquartered at Ft. Leavenworth, KS, the *Battle Command Training Program* offers corps and division commanders, their battle staffs and major subordinate commanders and staffs, the chance to train in a stressful environment. Units train using a computer-driven command post exercise (CPX) against a "thinking and reactive" opposing force (OPFOR). Units conduct CPXs at their home station.

After each major mission, training centers provide feedback as after action reviews (AARs). At the end of

illustration by Paul Fretts

unit rotations, the centers compile AARs as unit take-home packages. Having observed various training center rotations, we compiled information to assist aviation units in training center rotations. This article also updates current issues that will help commanders improve aviation training at the CTCs.

Intelligence

Intelligence preparation of the battlefield (IPB). IPB is the foundation for a successful mission accomplishment. Primarily, because of the experience level of aviation unit intelligence officers (S2s), consistently sound IPB is a difficult task for aviation units. Many aviation S2s have problems—

- Addressing the effects of enemy courses of actions on aviation operations.
- Performing combat analysis as the fight unfolds.
- Compiling and analyzing end-of-mission information into a meaningful package to plan future operations.

These problems are primarily a training shortfall. To improve this shortfall, commanders must press their S2s to:

"Those who cannot remember the past are condemned to repeat it."

George Santayana
1863-1952
American Poet
and Philosopher

IS YOUR UNIT READY?

Initial Planning

A unit sows seeds of success long before it arrives at the training center. Initial planning for a rotation must be thorough and complete. Preparing for a combat training center (CTC) rotation is a cumbersome task. Properly focused, planning enables the unit to prepare and maintain a "go to war" posture. A battalion commander must first assess his unit's capabilities. Using the guidelines in field manual (FM) 25-101, *Battle Focused Training*, a commander should "scrub" his mission essential task list (METL) to ensure that—

- It is current.
- It supports his unit's capabilities.
- It addresses contingency missions.

Close, collective scrutiny of the METL by the battalion commander, his staff, and company commanders provides—

- Prioritized missions.
- A snapshot of the unit's current level of training.
- A realistic training plan to prepare the unit for the rigors of training center rotation.

The commander should talk informally with the troops to ensure his assessment is valid. Then, armed with a complete and qualified assessment, the aviation commander should brief the ground component commander before rotation trainup. He should discuss training objectives, aviation troop list options and aviation employment. To foster rapport and promote understanding, the aviation commander should teach his ground counterparts an aviation class in "how to fight." The briefing should focus on the employment of a that task force (TF) that will fight at the training center.

Finally, the unit must contact the aviation combat trainers at the CTC. The aviation trainers must know arrival and departure dates, number and type aircraft in the TF and training objectives. Trainers must have a tactical standing operating procedure (SOP) to understand the specifics

- Study the 34- and 100-series field manuals (FMs).
- Conduct practical exercises for attack, cavalry and assault missions.

Reconnaissance. Each training center reinforces the need for effective reconnaissance (recon) to ensure a successful mission. With the enhanced capabilities of the OH-58D Kiowa, aviation is a big player in the ground commander's recon/counterrecon fight.

When employed at night with available intelligence systems such as QUICK FIX, TEAMPACK and ground surveillance radar, OH-58Ds repeatedly could find, fix and destroy enemy recon assets with indirect fires. Employed in pairs, the OH-58Ds were given dedicated Copperhead rounds and priority of fire during the entire counterrecon fight. When artillery support was inadequate, an alternative was to pair an OH-58D with an AH-64 Apache. To preclude piecemealing AH-64s, a balance must be struck between the value of the recon/counterrecon fight and anticipated attack missions.

Three imperatives for a good recon/counterrecon fight include:

- Dedicated intelligence systems to focus recon efforts.
- Dedicated artillery support with Copperhead munitions for threat

OH-58D performs reconnaissance.

about the unit. The more proactively involved the commander is with the aviation trainers, the better the training results.

Trainup

Each unit prepares for a CTC rotation according to its unique organization and METL. Thus, each prepares differently. All units should follow several basic guidelines to improve their performance at the training center.

Aviation is a tremendous combat multiplier; however, aviation's part in any fight depends on the weather and maintenance. Successful employment of aviation is developed around a sound ground plan that does not depend on aviation. Aviation commanders must ensure aviation is integrated effectively against lucrative targets at a decisive point in the battle. Liaison officers play a key role; they articulate, to the ground commander, those missions that best support the ground maneuver plan.

At home station, train as a complete package with the ground counterparts—no proxy players! Practice the rotation-critical individual tasks and crew drills until they become routine. Some of those include aerial adjustment of artillery, downed pilot recovery, secure communications, NVD reconnaissance (recon), navigation and identification friend or foe operations. Further, by practicing anticipated rotation missions, the unit hones collective training while perfecting combined arms operations. Following this concentrated effort, the unit should emerge highly combat-ready, having a deep belief in itself and ready to fight at the CTC.

Deployment

The unit should have one simple goal for deployment—arrive at the fight safely, smoothly and as well-rested as possible. Smooth deployment sets the tone for the rotation. The unit must designate personnel and train them for each mode of travel: air, rail and self-deployment. Special equipment is required to disassemble, load, download and reassemble aircraft. The composition and function of the advance party is tailored to accept the main body.

air defense artillery (ADA) systems and command and control targets.

- Clearly defined time frames for the recon/counterrecon fight with named areas of interest, targeted areas of interest, priority intelligence requirements and disengagement criteria.

Perishable intelligence. On several occasions, aircraft of different aviation units, operating in the same area, fell casualty to the same threat. With the tempo of battle and the density of different aviation units working the same area, units cannot rely on intelligence networks to provide timely threat updates.

Serving as a sole source, flight operations centers can facilitate timely threat updates by broadcasting threats over a navigational radio. Such a radio is the automatic direction finder (ADF), which is common to all Army aircraft. Broadcasting over ADF is advantageous because it frees up valuable, overburdened, two-way radios. If threat information is broadcasted, aircrews can receive updates without transmitting.

Fire Support

AC-130 Spectre gunship integration. During low-intensity conflict (LIC) scenarios with complete air superiority, the AC-130 greatly enhances night operations. The AC-130's strengths are immense firepower, a unique capability to illuminate the battlefield for night vision devices (NVD) with an infrared searchlight (GLINT) and a comprehensive communications package.

During NVD air assaults, AC-130 GLINT of the objective area enables aircrews to detect and suppress enemy threats better. GLINTing the objective area provides pilots a reference point and aids in navigating to and from landing zones. Within the periphery of the GLINT spot, pilots can distinguish

The aviation commander must codify exactly what aviation is to accomplish.

The aviation commander must analyze his own unit capabilities.

friendly troops with GLINT tape on their helmets from the enemy in close combat. GLINT enables the AC-130 to provide effective close-in fires without undue risk to friendly troops.

Because of its massive firepower, night optics, station time and vantage point, the AC-130 is better suited than attack helicopters for night air assault security in the objective area. Extending the commander's vision of the battlefield, the AC-130 can confirm or deny enemy activities. The AC-130 can relay this valuable information to the ground and aviation commanders. In so doing the AC-130 is a big player in the commander's command, control, communications and intelligence (C^3I) efforts. The AC-130 works well in a permissive environment against an unsophisticated enemy without similar night fighting capabilities. As evidenced during Operation "Just Cause," the AC-130 is a combat multiplier. It enhances the full spectrum of Army Aviation operations at night.

Air Force AC-130 Spectre gunships, like the one below, provide significant support to Army Aviation including fire support, C^3I, and GLINT.

Maneuver

Battlefield calculus. Battlefield calculus is an analytical process used to evaluate attack helicopter employment options. It starts with the ground commander's mission and intent for aviation.

The aviation commander must codify exactly what aviation is to accomplish. For instance, the mission may be to delay a second echelon motorized rifle battalion (MRB) by attriting it 50 percent. Three basic steps the commander must follow are:

Step 1. Since the mission statement is precise, IPB efforts can be focused to obtain:

- Unit strength, composition and number of combat vehicles.
- Where, when and how the MRB will be employed.
- Rates of march and best engagement areas.

The bottom line is to project the number of OPFOR vehicles by type and their exposure time in the engagement area.

Step 2. With a complete description of the enemy, *the aviation commander must analyze his own unit capabilities.* Specifically, he must plan for the mass employment of all capable attack helicopters. Next, he must know if the terrain will accommodate total employment of aircraft. In addition, the commander must determine how long the enemy will be in the engagement area. Knowing this time enables the commander to calculate how many engagements each aircraft can fire into the engagement area. Finally, the commander must factor the probability of kill (Pk) of the weapon systems to calculate accurately his unit's killing ability. This initial scrub gives the avia-

tion commander a quick sensing of his unit's ability to accomplish the mission.

Step 3. This step incorporates mission enhancers such as obstacles, artillery support and close air support (CAS). Properly placed obstacles decelerate and frustrate the enemy. They increase enemy exposure time in engagement areas, thus increasing engagements by all killing systems. Artillery support should be planned in two phases: self-protection and suppression of enemy air defense, and destructive fires. Historical data from the NTC reveals that it takes 18 dual-purpose, improved conventional munitions to destroy one combat vehicle. Clearly, destructive fires are more effective against a stationary force.

Integrating the U.S. Air Force as CAS or, preferably, as a joint air attack team (JAAT), is synergistic in the ruthless destruction of OPFOR vehicles. Figure 1 illustrates battlefield calculus:

Air assault security. Recent changes to FM 1-112, *Attack Helicopter Battalion*, state that attack helicopter companies can be task-organized for short periods of time to perform specific missions. During one rotation a commander placed a robust, six- by-six air cavalry troop (ACT) in operational control to an assault helicopter battalion to provide assault security for the battalion. The battalion employed the ACT in total and the ACT maintained unity of command, while providing the requisite reconnaissance and protection for the assault battalion.

Joint air attack team. JAATs continue to be difficult missions for Army Aviation to control. Over 80 percent of JAATs are spontaneous and result in random attacks by attack helicopters and U.S. Air Force aircraft; they have

1. Mission: To attrite a second echelon MRB 50 percent.	
2. Analysis of the enemy in number of vehicles	
—MRB has 43 vehicles.	43
—Currently, MRB is at 90-percent strength.	39
—Attrite 50 percent of 39 vehicles.	20
3. Unit capability analysis in number of aircraft	
—The attack helicopter battalion has 15 AH-64s on hand.	15
—Mission-capable AH-64s anticipated.	10
4. Analysis of terrain	
—Number of battle positions = a	2
—Number of AH-64s per battle position = b	3
—Number of engagements per aircraft = c	3
—Total number of engagements = a x b x c	18
5. Analysis of weapon systems in number of kills	
—Hypothetical Pk is .7; AH-64 kills = .7 x 18.	12
6. Analysis of mission enhancers in number of kills	
—Obstacles	4
—Artillery	1
—CAS/JAAT	4
7. Bottom line	
—OPFOR vehicles to be destroyed	20
—Anticipated kills by AH-64s	12
—Anticipated kills by mission enhancers	9

FIGURE 1: Battle calculus.
The initial scrub reveals attack helicopters kill only 12 of the 20 vehicles. Attack helicopters cannot accomplish the mission alone. With the added value of the mission enhancers, the mission can be accomplished. Battlefield calculus has many variables. This cookie cutter approach by no means paints a complete picture for the commander; however, it provides a quick measurement of attack helicopter success.

minimal effects. Clear standing operating procedures (SOPs) and adequate planning ensure successful JAAT operations.

In planning, suitable terrain with engagement areas and supporting battle positions must be portrayed graphically. JAAT missions are easier to coordinate and more effective if they are not prosecuted over the same terrain as the ground commander's close fight. Trigger points and a defined JAAT clock synchronize the combined effects of the JAAT players. A trigger point initiates the JAAT clock; all players must understand their sequence and duration in the JAAT operation. Communication nets, call signs, laser codes and authentication tables must be coordinated. Also, class V consumption must be forecasted. These guidelines are a foundation for a successful JAAT. U.S. Army Training and Doctrine Command Training Text 34-6, *JAAT: Multi-Service Joint Air Attack Team Operations*, contains further discussions on JAAT.

Direct fire employment. The training centers are equipped to determine who shoots whom and how many. Thus, they have made attrition warfare a fine art. Hamstrung by vague or improper missions, restricted to a TF-sized maneuver area and saddled with poor multiple integrated laser engagement system/air ground engagement system (MILES/AGES) equipment, Army Aviation is particularly sensitive to this reality. These shortfalls do not excuse us from fighting as best we can.

Army Aviation commanders must continue to employ attack helicopters to strike at the enemy's center of gravity. Target priorities must focus first on protection. Efforts must follow immediately to destroy the enemy's center of gravity. The center of gravity is the glue that holds a force together; it constantly changes. A smart commander can anticipate this variance

JAAT operations are synergistic in effect by combining the sophisticated weaponry of the AH-64 (below) with the maneuverability and agility of the A-10 (bottom).

photo by David B. Lindsay

and plan the enemy's demise. Timing, target priority and proper use of weapon systems against targets accomplish this attrition goal.

Command and Control

Synchronization. Synchronization poses a significant challenge to all commanders. An assault helicopter battalion commander uses an execution checklist as an effective technique for streamlining C^3. The execution checklist describes critical events logically. This checklist provides focus to the wargaming process so that all players can readily understand and contribute valued comments. Any commander can use this technique to carry out and refine his mission. A sample format is shown in figure 2:

Rehearsals. The importance of rehearsals can not be overemphasized. Rehearsals help identify disconnects and refine mission execution. Terrain boards allow all players to visualize the battlefield and collectively rehearse the execution of the mission. Together with an execution checklist, or matrix, rehearsals make the mission happen.

Combat Service Support

Staging bases. Aviation staging bases are not a novel concept. Separated into three distinct bases—forward, intermediate, and main—aviation units employed the staging base concept well.

At the forward staging base (FSB), the aviation unit pre-positioned only those aviation assets necessary for the current mission. This greatly reduced aviation's footprint forward. All players at the FSB focused on the current mission, so there was unity of effort. Positioned just outside the range of threat indirect fire systems, aircrews were postured to respond rapidly to changing missions. Because of its small size and function, the FSB was able to reposition quickly, if necessary.

Located in a more secure area, the intermediate staging base (ISB) provided the aviation unit sustaining capabilities not possible at the FSB. Here the unit was able to perform aviation unit maintenance and limited aviation intermediate maintenance. Therefore, the ISB must be white light capable to perform these maintenance activities 24 hours a day. Aircrews were able to

FIGURE 2: Executive checklist.

*Time	Event	**M/X	Net	To	From	Codeword
H-0 + 10	BEGIN SEAD	X	AIRSPOT	B78	C34	URSULA
H-HOUR	SER 1 ASSLT	M	CAN/ABN	F48	T25	AVALANCHE

* To ensure flexibility, times relate to H-hour.

**Reports are coded mandatory (M) or by exception (X). Exception means the event is automatic; a call is not necessary unless a change occurs.

recover from missions and could plan future operations without the problems and distraction of aircrews involved in current operations.

The main staging base (MSB) was a fixed location and more secure than the ISB. The MSB was capable of supporting 100 percent of the unit's needs on a continual basis. In this instance, the MSB was the home station. Clearly, this concept of staging aviation assets merits consideration. Staging bases are applicable through out the operational continuum in a linear or nonlinear battlefield. Aviation commanders at battalion and brigade level are saddled with austere units and the imperative to operate 24 hours a day. They can tailor staging bases to accommodate the unit's capabilities.

photo by SPC Isley

Aircraft and supplies move to the forward staging base.

Prepackaged Class IV. Prepackaged Class IV (construction) has successfully reduced the user's workload. Based on the tactical SOP, the unit pre-packaged Class IV, by function, into several packages that facilitated efficient air movement and delivery. Designed to provide manageable loads, the packages were developed with a standard load of materials for specific engineer requirements. Prepackaging enabled aircrews to preplan aircraft loads, which streamlined the upload and download of cargo. Three of the package configurations are shown in the figure at right.

To accommodate the user and facilitate optempo, prepackaging of Class IV must deliver and emplace preconstructed obstacles like caltrops, abatis, boulders and logs. Clearly, prepackaging lends itself to the application of other critical, high-usage classes of supply such as Class III (petroleum, oils and lubricants) and V (ammunition).

Downed aircraft recovery. To preserve combat power, aviation commanders put a premium on recovery of aircrews and aircraft. Affectionately termed DART, the downed aircraft recovery team— composed of medical, maintenance and security teams—was quite effective. Dependent on the mission profile, the DART was postured initially at the forward arming and refueling point (FARP) and moved forward as missions necessitated. Commanders dedicated a UH-60 Blackhawk for DART missions. The aviation unit must have a plan to perform internal downed aircraft recovery.

Sustained operations. To facilitate optempo and operating aircraft in excess of the crew day, aviation commanders should consider "ramping up" crews to extend aircraft operations. All aviation commanders must manage crew endurance. They must

FIGURE 3: Prepackaged Class IV.

Road block	20 rolls of concertina 20 long pickets 20 short pickets 1 roll of barbed wire
Minefield	24 M-21 mines 24 M-16 mines 12 M-15 mines
Overhead cover package	35 sheets of 4 ft by 4 ft plywood 30 4-foot lengths of 4 inch by 4 inch posts 50 long pickets

understand the mission load and ensure that crews are available and on hand to support it.

Improved firepower for the UH-60. Organic to the UH-60, the M-60D 7.62 mm machinegun does not have a rate of fire sufficient to suppress all unexpected enemy threats. Ideally, attack helicopters would provide assault security. A door-mounted minigun would provide the requisite firepower of 2,000 or 4,000 rounds per minute. A minigun does not have to be mounted on all UH-60s; but, one minigun-equipped UH-60 per assault serial is plausible. At least, one UH-60 per battalion should be equipped with miniguns to conduct downed aircraft recovery.

Improved firepower for pilots. The .38 caliber pistol does not provide pilots enough personal firepower in a downed pilot situation. Small enough to tote, the MAC 9, fully automatic, would fill this shortfall adequately.

Forward arming and refueling point operations. FARP security is a problem. FM 1-104, *Forward Arming and Refueling Points*, is shallow. It does not discuss security adequately. FARPs always will be the vulnerable "underbelly" of any aviation unit. A FARP's survival hinges on its ability to reposition. Because of the explosive nature of aviation Class III and V, coupled with the lack of organic firepower, standing ground and defending soldiers and equipment is not always a viable option. However, this does not exempt the III/V platoon from providing a credible reactionary force capable of repelling a level 1 threat. The III/V platoon must at least be capable of laying a base of fire so that soldiers and equipment can leave. Ideally, a FARP team should include a Stinger missile team to provide dedicated air defense. This is not an absolute requirement, if the FARP is located under a comprehensive air defense belt.

FARP operations at the National Training Center.

Armed with a radio, M-60 machineguns, Vipers and Claymore mines, FARP personnel, when attacked, should perform a standard reaction drill. Requiring valuable engineer support, hardened FARPs are an option but should be limited to more static FARPs, in the rear area. A dedicated Stinger missile team, engineer support and reaction drill are not the panacea to FARP security, but they are a good start and warrant further development.

Mobile Class V cache. To facilitate quick turnaround of attack aircraft, units have cached ammunition. The idea is smart; however, caches must be responsive. Static caches or those tethered to the mobility of ground vehicles will fail. Extremely vulnerable, these caches can not keep pace with a fluid battlefield. Loaded on a UH-60 complete with an armament contact team, a cache reduces turnaround times and facilitates optempo for attack aircraft.

Forward area refueling equipment (FARE). Pumping at a slow 100 gallons per minute (gpm), the current

"Looking back is the surest way of looking forward."

J.F.C. Fuller
1878-1966
British Military
Theorist

FARE is a burden commanders should not have to bear. Proportionately reduced as refueling points are attached to a FARE, the pump rate brings aircraft turnaround times to a standstill. A FARE upgrade is mission imperative and particularly important because the Army's fleet of advanced aircraft holds considerably more fuel. The FARE should be upgraded from 100 to 350 gpm—a rate commensurate with the highly successful heavy equipment tank transporter refuelers.

Light/Heavy Force Integration

Task organization for an aviation contingency package. An aviation TF organization is based upon the density of anticipated missions. Two primary types of TF-oriented missions are assault and attack/cavalry. An aviation TF for a light force must consider the competing requirements for mobility and firepower. There may be an equal need for assault and attack oriented TFs. If so, an attack-oriented TF should be the centerpiece because of the complexities involved in employing an attack battalion. The size of the aviation TF, in most cases, requires the majority of aviation brigade assets. Therefore, the aviation brigade should control the TF.

IPB of a lodgement. Enemy composition around a lodgement must be carefully analyzed. S2s must delineate threats by category, (i.e., dismounted, motorized, etc.) Threats must be identified by sector around the lodgement. Commanders must assign their collection efforts to the best asset to perform the job. It may be impossible to cover the entire area around the lodgement. If so, commanders must put sectors in priority sequence based on the greatest threat. NAIs should be built around timelines out from the lodgement. IPB in the LIC environment requires more emphasis in manuals and classrooms, since LIC is becoming more probable.

Aviation employment during the lodgement. When a lodgement is unsecure, Army Aviation assets must prosecute assigned missions immediately and vacate until the lodgement is secure. Secure is a relative term. For aviation, it means protection from a quick, motorized threat and indirect fire.

Aviation support packages must be parcelled into varying sizes to sustain aircraft in the lodgement. Each package should be tailored to provide "X" number of hours of sustainment.

The critical question is when to commit these assets. Commitment is based on how long it takes to evacuate the support package, if the unit is attacked. The S2 must provide reasonable assurance of how long the threat will take to attack. If that time is equal to or greater than the time it takes to extract a support slice, then the support slice should be committed.

Aviation units should be positioned inside the reserve force for protection. A portion of the reserve should be designated as a reactionary force to protect aviation assets. Collocating aviation assets with the reserve force is mutually supportive. The reserve force protects aviation assets. Aviation can quickly move the reserve to respond to hostilities.

Command and control of Army aircraft during the lodgement phase of contingency operations. During lodgement, the ground commander must have a direct link to Army Aviation. Clearly, the aviation commander or operations officer (S3) should be collocated with the ground commander. The airborne command, control and communication in a C-130 is an ideal platform for communications between

the ground commander and inbound aviation assets.

Security of air assault landing zone (LZ) during light/heavy operations. During live fire, a commander gave the heavy TF the recon/security mission of an LZ for a light infantry company. The heavy force was engaged decisively in close combat; it was unable to shift its focus to LZ recon and security. Consequently, the assault lift dropped troops in an unsecure zone. The heavy force could not incorporate light fighters into its scheme of maneuver.

Aviation must conduct internal LZ recon/security. Aviation can facilitate light/heavy force linkup with vantage points (ability to see) and communications (ability to guide).

Deployment shortfalls. The current fleet of Army helicopters requires a varying amount of disassembly to fit on a C-141 or C-130. This drill requires reassembly and test flights before the helicopters can be employed; takes valuable time and wastes manhours. In addition, a sizeable maintenance support package must be in place at the destination. The multipurpose light helicopter fills this shortfall.

Troop movement of conventional forces during relief in place with Rangers and Special Operations Forces (SOF). As conventional forces air landed, they were organized into 20-man teams. Those teams were quickly transported by UH-60s to designated positions around the lodgement. This movement facilitated a rapid relief in place with the Rangers. UH-60s dropped off troops and exfilled the Rangers and SOF. In a forced entry, troops must be organized into 20-man teams before deployment.

Logistic package (LOGPACK) operations. At night using NVDs, the aviation TF conducted LOGPACK operations down to platoon level for the light force. One UH-60 went to the brigade support area to pick up a company representative and supplies. The company representative told the aircrew where to drop off the supplies. Supplies were prepackaged to accommodate a platoon-size element. Besides platoon resupply, the UH-60 inserted or exfilled any platoon personnel. This is an excellent way to sustain light fighters.

Operations must be conducted at night using NVDs to enhance survivability.

Light forces at a pickup zone.

Current Issues

AH-64 MILES/AGES II. Recently, an assessment was conducted at the NTC to determine effectiveness of the prototype AH-64 MILES/AGES II. Results were mixed. Apache MILES/AGES II did not perform as anticipated; however, it was an improvement over previous efforts. Installation, boresighting and maintainability continue to plague the current generation of MILES.

Two days during the rotation, aviation was the biggest killer on the battlefield—killing 22 and 31 vehicles, respectively. Seven AH-64s achieved these results. This achievement is a particularly noteworthy milestone, considering the number of ground systems employed that fell short of that mark. Aviation's success forced the OPFOR to respond in three ways as follows:

- Use of artillery against AH-64s increased because OPFOR ADA systems could not range AH-64s.
- Counterattack forces were prudently employed. Counterattack forces can no longer move with impunity about the battlefield.
- All vehicles of the forward security element and flank guard will have surface-to air-missiles (SA-14s).

MILES/AGES II has improved, allowing AH-64 units to prosper from the CTC experience. Future MILES systems should be embedded in aircraft so their operation is totally transparent to aircraft employment.

Observer/controller aircraft. It will soon be possible for the NTC and the JRTC to provide internal observer/controller aircraft support. Each training center has received three OH-58A/C helicopters. Once necessary personnel arrive, the player unit's requirement to support aviation observer/controlers with aircraft and pilots will be greatly reduced. Observation of AH-64 and OH-58D operations will require support as will certain rotations with a high volume of aircraft.

Conclusion

Everyone pays special attention to how Army Aviation performs because of the cost of its systems and programs. Many aviation units have learned valuable lessons from their CTC experience. By taking advantage of the successes and failures achieved on the CTC battlefield, the entire aviation force benefits from the lessons learned.

AH-64 in battle position at the National Training Center.

This is the first in a series of several articles on lessons learned under the Battle Command Training Program, the Army's newest Combat Training Center, based at Ft. Leavenworth, KS.

Attack Mission Planning

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ATTACK MISSION PLANNING

THE CHIEF OF STAFF of the Army established the Battle Command Training Program (BCTP) to assist corps and division commanders train their units. The BCTP is the Army's newest Combat Training Center (CTC), based at Ft. Leavenworth, KS. It extends the positive training aspects of the CTC methodology to the division and corps level. It is the final pillar to collective training from platoon to corps.

The mission of the BCTP is to provide tough, realistic, stressful, high-quality command and battle staff training for corps and division commanders, battle staffs and major subordinate commanders, worldwide. And it is to serve as a source of data and lessons learned on corps and division operations.

A BCTP rotation includes three interrelated but separate exercises: a BCTP seminar, a warfighter exercise (WFX) and a proficiency sustainment package (PSP).

The seminar is conducted at Ft. Leavenworth. It is a 5-day exercise. It allows the commander and staff to conduct a leader's reconnaissance before the battle of the warfighter.

The warfighter is a 5- to 7-day exercise conducted at the training unit's location. Exercise units deploy command posts to field locations. The BCTP provides a competitive, free-thinking, realistic opposing force that tries to win. The combined military and a contract civilian staff assist the exercise headquarters in the presentation and control of the simulation; replication of all battle actions; observation and analysis of staff actions and presentation of the afteraction review.

The PSP involves the corps or division commanders' providing snapshots of two to three events that occurred during the WFX. BCTP collects all orders, commander's guidance, operations and intelligence summaries, overlays and unit status reports during the WFX and prepares these products to organize the PSP. This, in turn, is used by the training unit to sustain the warfighting skills developed during the WFX.

corps, division and brigade staff training for more than 2 years. During this period, the author has had the opportunity to observe and analyze the efforts of many of the division and three of the corps aviation brigade staffs. In addition, he has taken part in operations, observation and control, workstation control and analysis. This article is intended to share those observations with the aviation community. This is not an official release of BCTP lessons learned.

Tactical planning is the basis for all combat actions and is the topic for this first in a series of several articles. Field Manual (FM) 101-5, *Staff Organization and Operations*, details the decisionmaking process and applies to division and brigade operations. The service schools provide extensive instruction and practice in preparing staff estimates, courses of action and wargaming. The commander's role includes the option to truncate the process and receives substantial attention in the school system. These observations confirm that commanders and staff officers understand the process. The execution of the process is the basis for the comment.

A BCTP exercise normally begins with a complete set of orders from echelons above corps through brigade. The brigade order is produced, distributed and generally understood by all levels of command. Annexes, overlays and supporting documentation are reasonably complete. This normally is the first and last complete execution of the decision cycle. Subsequent orders are produced in an abbreviated format, usually beginning with the commander's intent and concept of the operation. This becomes paragraph 3 of the order. This is an acceptable practice under proper circumstances dependent on solid standing operating procedures (SOPs) and complete understanding by a well-trained and experienced staff.

The analysis of the units observed indicates many mission execution deficiencies can be attributed to incomplete planning and invalid assumptions. The end result of the incomplete planning and orders process often produces the following type mission:

An attack helicopter battalion is directed to attack an armor formation across the forward line of troops without fire support. No friendly or enemy update. Brigade or division sometimes plans suppression of enemy air defense fires. Targets and timing

are not provided to the attack battalion. Supporting electronic warfare assets may be planned, but details are not provided to the attack battalion. Combat service support activities are not considered or coordinated with the attack battalion. The attack battalion is postured to receive missions but has no specific orientation. The attack battalion is expected to launch within 15 minutes. It is dark with acceptable ambient light. Ceiling is less than 1,000 feet; visibility is less than 1 mile.

Hopefully, most would agree this is not the optimum condition for successful mission accomplishment. An examination of the brigade staff contribution to this mission reveals the sources of the incomplete order.

Intelligence Preparation of the Battlefield (IPB)

Operations order: Generally, products from the IPB process are reasonably complete in the brigade operations order issued before the exercise. Most of the information extracted is from the order higher headquarters produced.

Aviation peculiar information, such as a detailed doctrinal air defense template and weather data, is acquired and published. A comprehensive enemy air defense artillery situational templating usually is not included. Enemy air defense avenues of approach are depicted sometimes but frequently not considered when recommendations for assembly area and forward arming and refueling point (FARP) locations are rendered. Often ground maneuver peculiar information is ignored, particularly mobility corridors and friendly and enemy obstacles.

The result is incomplete templating for the divisional cavalry squadron or other forces the brigade employs. Given adequate IPB at the start of combat operations, an examination of subsequent staff actions is in order.

Intelligence updating: The most frequent observation is that intelligence updates from higher headquarters are not posted to the situational map. Nor is the information disseminated to subordinate units. In contrast, most units do an excellent job of monitoring tactical radios to extract spot reports. Spot reports, once posted to the map, are not used to update IPB templating to develop the disposition of other enemy forces. Air defense umbrellas that are easily templated remain undetected because the brigade staff lacks analytical ability.

Many staff sections do not record the time that the reports were current. Often tactical decisions are based on information 12 hours old. Information originating from subordinate units is also not processed in a timely manner. Ironically, the brigade level headquarters with routine access to division-wide activities seldom report information to the division intelligence center. Equally regrettable is the fact that information is not shared with subordinate units.

In summary, the situational map is generally useless as a planning tool except immediately after a new order from higher headquarters is issued and posted that contains an intelligence annex.

Templating: FM 34-130, *Intelligence Preparation of the Battlefield*, describes the use and preparation of templates and support matrix applications. Most staffs observed do not use these techniques after the initial order is produced. Weather effects and terrain templating serve the targeting effort and mission planning. Often courses of action are developed with no regard to the effects of weather or terrain on enemy movement speeds and arrival at a decision point or into a target area of interest (TAI).

Likewise, little attention is given to weather and terrain impact on attack operations. Meteorological and terrain restrictions on weapons acquisition and tracking systems are not considered. Most brigade staff sections do not know the limitations of the OH-58D Kiowa or AH-64 Apache navigation, acquisition or weapon systems. Event templates are rarely used to generate named areas of interest. Decision support templates are not used to depict TAIs and complementing decision points. All of these tools are vital to the development of the commander's priority intelligence requirements (PIRs) and information requirements (IRs). Intelligence gaps identified in the templates are not used to develop the PIRs and IRs. Most often the brigade staff is unable to visualize the battle; therefore, it has no capability to prepare and execute contingency missions.

Results are predictable. Attack operations often do not engage the intended target force simply because the target unit is not where it was predicted to be. Most often, the enemy has already passed the engagement area.

Current Operations

Situational map and decision aides: Like the intelligence section, current operations often have difficulty keeping the situational map current and accurate. Ground maneuver actions are generally ignored in favor of a general depiction of the forward line of troops. Reports from liaison officers and subordinate units are seldom requested and, when received, commonly are not used. Most units do not use decision graphics and matrices.

Operational control (OPCON) units: Aviation brigade units OPCON to other headquarters are generally ignored. The logisticians usually fulfill their duties providing support to the unit. The impact on future operations normally is given little consideration until the unit returns exhausted, depleted and combat ineffective.

Support operations: Missions are executed routinely from a general mission tasking: "Be prepared to support 2d Brigade north of phase line viper." A unit is warned to be prepared to respond. Division orders the execution. The aviation brigade has not established or directed liaison and does not have current friendly locations, enemy situation, operations graphics, fire support relationships or commander's intent. The only recourse is to send a battalion representative to coordinate the required support, a time-consuming process.

The common result is commitment of aviation assets too late to influence the tactical operation in the manner that the ground maneuver commander desires.

Operations Planning

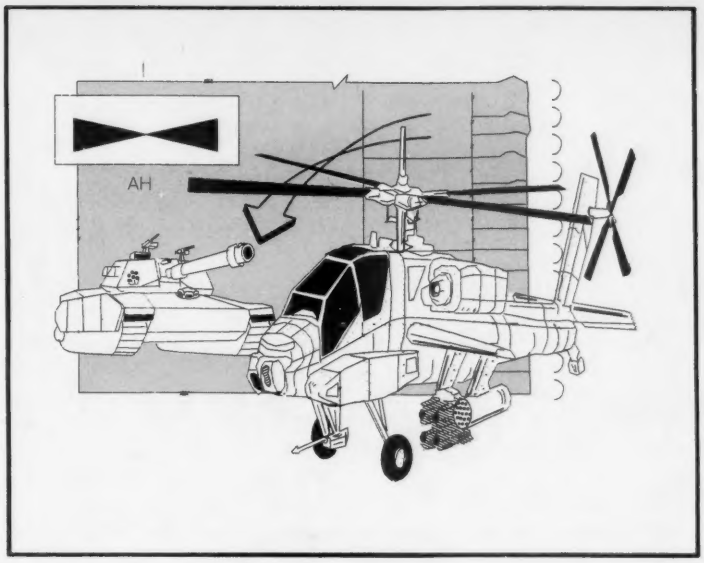
Branches and sequels: The missions the aviation brigade routinely receives demand continuous updating and wargaming. Mission deviation within a general mission statement is best addressed by aggressive planning for branches and sequels. The questions: "What do we do if the enemy attacks differently than planned?" or "If we attack here, what is our most likely follow-on mission?" are not often asked. The results usually are a hasty reaction rather than a planned, positive action. Most brigade staff sections do not maintain a complete and current situation map from which to anticipate accurately the branches and sequels.

Time: The time provided by division and brigade to plan missions is often grossly inadequate. In peacetime, a great deal of time is spent analyzing the terrain, air defense threat, impact of darkness and weather, coordination procedures, attack sequence and supporting forces. During BCTP exercises, battalion commanders are directed to execute missions in less than 1 hour. Most often crew briefings could consist of no more than "this is where we are going, we will brief the rest in the air." Unfortunately, requests for more information seldom result in a timely response from brigade.

The advantage of a computer-based exercise is that no soldiers are injured and no equipment damaged. Are we practicing our combat skills or attempting to play a game? Seldom is a commander observed advising his superiors that he cannot meet time constraints, even if it is in violation of established procedures. There are combat situations that require a quick reaction after the commander assesses the risks. There has been little evidence that the assessment is ever done. Hasty launch directives are the rule—not the exception.

Integration: The use of fire support, electronic warfare, air support and other force multipliers are most often restricted to meeting the perceived observer controller checklist items. The integration of supporting assets and, most important, their individual and collective contribution to the mission are seldom assessed.

Field artillery warrants separate discussion and is addressed later. Air support usually is only addressed when it is part of a joint air attack and not as an integrated diversion, suppression or supporting attack. Electronic warfare normally is requested in terms of system availability with no real consideration as to what is desired or required of the system. Wargaming does not include a scenario considering options with and without supporting as-



sets. The weakness of a plan is seldom discovered or considered until it is executed.

Fire Support

Suppression of enemy air defense (SEAD): SEAD fires are seldom executed adequately. All of the issues addressed previously contribute to poor SEAD support. Targeting usually is not accurate. Division does not give it much attention and aviation brigades do not often demand it. Responsibility for targeting, scheduling and timing are often confusing and seldom defined. The mission commander seldom ever knows what SEAD targets are being fired or the fire support schedule. SEAD fires normally are not synchronized with the aerial scheme of maneuver. The means to change the time because of mission delays are seldom coordinated and almost always do not reach the firing unit. Quick fire channels rarely are established.

Supporting fires: SEAD usually is the only fire support considered. Fires to support the attack are not considered or requested. Fire support channels or missions are not established to support the operation. This leaves the attack commander thumbing through frequencies to hail a responding fire unit or, worse yet, take on the enemy alone. Frequently brigade staffs accept a situation that provides supporting fires from the direct support artillery unit in support of the ground maneuver force in sector or zone.

The result is no priority of fire is established for the aviation force. Fires are provided to the priority ground maneuver forces and not to the aviation force.

Logistics

Operational constraints: Battalion commanders manage resources in the workstations and report status of supplies in accordance with the SOP rather than actual requirement. Mission planners at brigade seldom consider the availability of supplies on hand and those projected inbound when assigning missions to subordinate units. Restrictions are almost never imposed. Logisticians are often not consulted. Part of the problem rests with the simulation. Supplies routinely exceed the theater stockage and resupply ability.

FARP management: The tactical use of FARPs has been practiced widely. Planning usually does not permit realistic displacement time. In the past, the simulation allowed this practice because of model engineering. The new versions of corps battle simulation software incorporate congestion and reduce movement speeds. More timely planning, positioning and coordination for FARP movement will be required in future exercises.

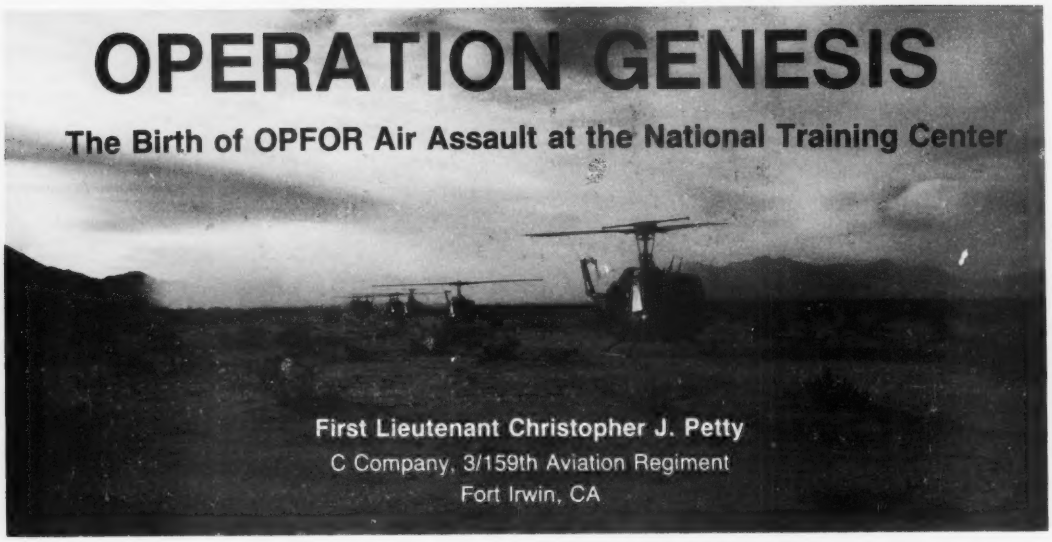
These observations are offered to provoke thought and discussion. Every staff is unique and every commander is different. Hopefully, these comments contribute to improved staff training and discussion of the trends that have been presented.

Some readers will point to the deficiencies of the simulation, real and perceived, as the basis for less than perfect staff action. I am confident that simulation does not inhibit or restrict effective staff action. BCTP continues to strive to make the simulation invisible to the staff elements in the field. It is the mission to make your training more effective and help Army Aviation be the dynamic combat force we all know it should be.

Responses, comments or questions should be sent to Major William E. Gagnon Jr., Battle Command Training Program, Fort Leavenworth, Kansas 66027-2063.

OPERATION GENESIS

The Birth of OPFOR Air Assault at the National Training Center



First Lieutenant Christopher J. Petty
C Company, 3/159th Aviation Regiment
Fort Irwin, CA

Mission: *C Company, 3/159th Assault Helicopter Company, will insert three OPFOR Infantry platoons deep into enemy rear to disrupt command and control elements before the main assault.*

Results: *The three OPFOR Infantry platoons escaped a firey landing zone, caught and destroyed a TOW platoon engaged in mess operations, moved 2 1/2 kilometers at night and successfully destroyed the U.S. Task Force 2-47's tactical operations center. Command and control was disrupted significantly along with other collateral damage. The overall successful operation greatly influenced the next day's battle.*

THE CALM OF dusk was settling over the National Training Center, Ft. Irwin, CA. The distinct desert landscape was deepening and softening as the shadows grew on the sandy floors. The air was still and cool on this mid-February eve. The calm was illusive, however, because each person knew that a short flight away U.S. forces were digging in, preparing for tomorrow's battle.

Observation posts members positioned themselves on hilltops, and Stinger teams waited patiently in the rocks to greet our aircraft. Was our intelligence update an hour ago of any use? We had to trust it. The mission had begun.

Precisely on time hacks, serials of four lined up and departed our rear area airfield. Radio silence was broken only three times when each flight lead uttered the code word for takeoff. The 20-minute

flight to the pickup zone (PZ) was silent as the three serials traveled, low-level, to the designated site. Thirty-six troops with different thoughts hung in the air under rotor blades that appeared to be moving in slow motion.

Flight lead's call to the PZ control element requesting landing direction and condition again broke radio silence. Purple smoke oozed up from the ground and the three serials (black, gold and grey) rolled in for a straight trail landing. The entire flight was down. Thoughts immediately shifted to the huge dust signal we had created during landing. Would the enemy see it? We could only hope not.

Modified to resemble a Hind, this UH-1 used by OPFOR is called Sokol (Desert Hawk). The Sokol OPFOR gunship provides fire support (inset).

On signal from the crewchiefs, opposing force (OPFOR) infantry rushed on board and strapped in for flight. The detailed hands-on briefing a few days earlier paid off. The normal awkwardness was gone, replaced with a quick mechanical readiness of someone experienced in this strange mode of travel. The flight was ready and the code word was given. Flight lead knew that now could prove to be the most challenging phase of the operation.

The entire flight had to wait nearly 12 minutes to adhere to the time schedule and deliver our precious cargo at the requested H-hour. It seemed like hours as we sat there waiting for the clock to move. Then, 5 minutes before our departure, the three OPFOR gunships (Sokol) rolled in from the north. They were in a V-formation and landed to the flights' two o'clock position about 150 meters away. They were returning from the battle area where they had cleared some of the route and executed two false insertions. Now, the air assets were ready, linked up and on the ground at the PZ. I remember feeling a strong reassurance when Sokol arrived. The whole now felt much stronger than the mere sum of the pieces.

One minute before our departure time Sokol lifted off as two sections and slowly moved ahead on our route. At PZ departure time, flight lead gave the code word, and we departed low-level toward the forward line of own troops. Once again, the flight was moving with a cold, mechanical proficiency of a destructive weapon of war.

At first, the terrain was a welcomed friend. It masked both our movement and our sound from the enemy to the north. The flight progressed past our two air control points and into a contour flight mode. We found ourselves mercilessly thrown into the open expanse known as the Central Corridor. It was an unavoidable part of the flight that brought with it the widening of the eyes and the quickening swivel of the head. The flight, 12 aircraft with 3 armed escorts, dashed across, flying 30 feet at 100 knots above the desert floor.

As our formation approached the concealment of a large draw in the North Wall, the anticipation suddenly turned to adrenalin. Four hundred meters away at our one o'clock position, hidden in the rocks, came a distinctive white puff of smoke. Immediately, we knew it was the signature of the highly effective U.S. Stinger missile. The flight broke

OPFOR gunship.

up the draw, while our point gunship banked right to engage. The gunship managed to distract the enemy enough with a salvo of rockets that the flight slid by unharmed. Frantically, we scanned the rocks for enemy Stinger teams as we moved hastily up our draw.

It was about this time we noticed the large smoke screens that our artillery units had placed in the surrounding terrain. The smoke was designed to confuse the enemy as to our routes, but to us it looked like a large cloudbank, closing ominously in on our options. We were being force fed into the enemies' lair. If we turned from our course it meant instrument meteorological conditions, low-level among the rocky hills. Our choice was clear.

We anticipated cresting the ridgeline known as North Wall and meeting enemy forces in Echo Valley. It this regard, our intelligence briefing was true to form. As soon as we slid into Echo Valley from the south, U.S. forces were everywhere. We flew 3 kilometers (km) in front of an advancing U.S. Armor battalion. Luckily, they were completely caught off guard and did not engage us until we were well beyond their ranges. Surprise was our best ally and it was working. We flew low, with the sun at our backs, to try to afford ourselves every little advantage we could. Terrain, however, was our weakness. We were flying low and fast but it was not enough; we were very exposed.

Flight lead adjusted the route and airspeed to avoid-enemy overflight, while allowing our Mi-24 Hind-D escorts to peel off, engage targets and rejoin the formation. Our two Hind sections worked overtime. The lead element cleared our route and fought up to the landing zone (LZ) for a final prep. The other section, composed of two gunships, worked frantically to provide the main body with security and fire support. They looked like two large birds doing some mating ritual as they supported each other on attack runs. The four to six Hind aircraft that the Soviet's would actually use was but a passing wish. We took the cards we were dealt and hung in the balance together. After 8 km of being vulnerable, the LZ was in sight. It was the mouth of a large draw connected to a hill complex.

On the ground, a U.S. soldier was talking to his buddy as they moved to the mess area. They were obviously tired from the hard work they had done getting ready for tomorrow's battle with the OPFOR. The first sergeant

had just given them the "thumbs up" on their prepared positions and let them go to the mess line.

Minutes later, they heard the distant noise of helicopters. They craned their necks looking up at the sky for the source of the growing noise. The large valley's echoes compounded the problem. Someone started yelling "enemy helicopters!" and pointing straight out to the southwest. They turned their heads to see a Hind-D flying straight toward them at 50 meters, causing chaos. That was not all. There were two more of them unleashing on adjacent positions, followed by a dozen troop lift helicopters.

How could this be happening? The battle was not until tomorrow. By the time they realized what it was, the MILES (multiple integrated laser engagement system) buzzers rang in their ears.

As flight lead approached the LZ, the crew could see enemy vehicles and positions to the south. Then, Sokol broke squelch to confirm that the LZ was occupied with dug-in positions. Black serial tried to break right before committing to the mouth of the draw. However, as they saw the rough terrain on the backside of the draw, they proceeded with the original plan.

They pushed up the draw as far as possible away from the maturing kill zone. The formation, taking heavy fire from the left, landed quickly. Grey serial was the most exposed and bore the brunt of the fire. Two aircraft were destroyed going in. The crewchiefs gave the signal for the infantry to unload, which they did with extreme haste. The two aircraft that were killed, however, kept their passengers on board. The word for takeoff was given in sequence by all three flight leads. We headed west trying desperately to get the hill complex between us and the explosive LZ.

Each serial gathered in their collectives, flew up the draw and over the ridgeline. It was a relief to get away from the smoke and chaos that our unexpected arrival had caused. In a temporary state of relaxation, my mind drifted to the infantry we had just unloaded.

I could not help but respect the men who jumped out into that heat on the ground. I hoped they had a plan for such an active LZ. I kept thinking that their only hope was scurrying into the rocks and linking up under darkness. We had inserted them precisely at the desired H-hour. I wondered, though, if they realized it left them 15 minutes of daylight exposure. Only time would tell.

I felt relieved that it was not us walking into that inferno. Somehow our intelligence had gone wrong. U.S. forces had moved into our insertion area. Our surprise was a multiplier, but their positioning became an equally proportionate divisor in our little equation of war.

The flight was moving rapidly along the desert terrain. We left a bit more cushion now between us and the rocks because of the gathering darkness. The radios were quiet. We were given this return route by the OPFOR regimental operations officer and we were having a smooth go of it. It took us on the west side of the football-shaped outline we appeared to be flying on the map. I turned my head around trying to account for the three serials. At that instant my platoon instructor pilot in the right seat said, "Rear support area! We're taking fire!"

We banked left and tried to mask. Unfortunately, two of our Sokol escorts on the left side of our formation were constricted from any action. Sure enough, we had flown close to the Blue Force brigade support area. We had flown close enough, in fact, to lose another one of our aircraft to a .50 caliber machinegun.

We whipped around to the south and flew clear of the area. The flight came up a bit higher now that darkness was approaching. As we crossed back over into friendly airspace, we all breathed a collective sigh of relief. Our three serials of four with three armed escorts headed direct for our little airfield in the rear. Fifteen beacons came on in the night sky filling it with life. From the distance it looked like red lightning bugs dancing and playing without a care in the world. Under the rotating lights hung the troops who, for the first time in a while, felt they renewed their bonds with the Army and possibly affected the outcome of the battle.

Tomorrow we would all go back to flying the generals, colonels and the many distinguished guests who visit Ft. Irwin every day. But tonight we felt satisfied. We had been given the chance, however small it may appear, to be warriors again.

APACHES IN THE DESERT

Tactical *lessons learned* from the AH-64 Apaches' debut at the National Training Center (NTC), Ft. Irwin, CA.

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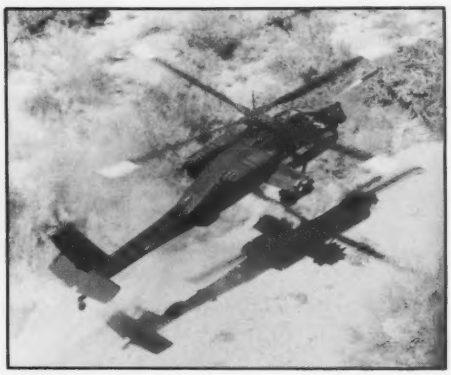
THIS ARTICLE points out the *lessons learned* during the Apaches' first trip to the NTC. The author targets the information for AH-64 units to help them prepare for combined arms operations or desert warfare. Army Aviation learned many lessons during the Apaches' debut.

As an NTC observer controller, the author viewed AH-64 employment from many aspects. He flew with the unit on force-on-force and during live fire. He also observed battles from the "Star Wars" control building, the unit's operations center. He discussed the day's battle with leaders from the opposing forces (OPFOR).

Ft. Irwin has become a showcase for soldiers to explore and refine tactics for the Army's newest weapons systems. The immense mountainous desert is an ideal place to garner *lessons learned* from battles with an enemy using high-speed armor tactics. More than 200 mock Soviet vehicles and a force of 2,000 soldiers trained on soviet tactics act as opposing forces. A rotation at NTC is the closest thing to actual battle that one can experience in the U.S. Army.



Intelligence

As with any weapon system, the success of the AH-64 Apache on the modern battlefield depends on good intelligence. During the "war" at NTC, many leaders rediscovered the value of intelligence. Intelligence assets must find the enemy before employment.

Intelligence Collection and Dissemination. To support intelligence acquisition, higher headquarters should integrate the Apache into the intelligence acquisition and collection plan. The ground units overlooked the AH-64 as an intelligence-gathering asset. The Apache was generally viewed as a "killer." AH-64s, with their long-range visionics, could identify OPFOR vehicles much farther away than could ground units.

The fire control computer (FCC) provided more accurate grid locations for enemy locations. Often, this information never made it to the ground unit. The attack battalion intelligence officer should forward any intelligence to the maneuver unit.

The OH-58D Kiowas did an outstanding job of reconnaissance. The OH-58Ds are few in number and can cover only a small portion of the battlefield. However, the attack battalion can augment the OH-58D.

Radio Limitations. AH-64 units must plan for the known limitations of Apache radios during the intelligence-gathering cycle. The mountainous terrain of the Mojave Desert made frequency modulated radio communication unpredictable. Often, soldiers could not tranmit important radio messages. They often had to use OH-58Cs to relay information to the AH-64 commander or move to a new position.

A valuable tool taught in our service schools is the decision support template (DST). During live fire, the assistant operations and training officer used this template effectively to prepare for the wet joint air attack team (JAAT). The DST also assisted the air mission commander in integrating the combined arms assets used in the JAAT.

The DST is a matrix depicting decision points keyed to significant events. The DST uses a time line to indicate when the commander intends to employ each combat asset. The DST also explains how the commander intends to employ the assets. Leaders can use these templates as guides to show when they will make tactical decisions and the elements those decisions affect.

The DST helps leaders to grasp the decisionmaking process they use at the battalion level and higher. Knowing the key decision points helps everyone understand the mission on the ground and how it supports the overall plan.

Maneuver

The NTC is primarily a stage for close operations. The unit learned many lessons on employment of the AH-64 in the close battle. This section is divided into four topic areas: Seeing the Battlefield; Combined Arms Operations; Offensive Operations; and Defensive Operations.

Seeing the Battlefield. The Apache's visionics—day television (DTV), forward looking infrared (FLIR) and direct view optics (DVO) worked excellent in the desert. The low- desert humidity allowed AH-64 aviators to see and identify targets on DTV almost twice as far as in humid environments. Aviators identify targets more than 9 kilometers away in zoom field of view with little distortion.

The FLIR quality was outstanding because of the high rate of emissivity in the desert. Target spotting in FLIR was easy, because no other heat sources of the same temperature were in the engagement area. The hot vehicles on the cold desert background readily stood out. DVO was also exceptional, but was more affected by obscurants.

The laser rangefinder determined distance and located targets. The desert environment, with its wide-open terrain and clear skies, easily fooled the naked eye. The laser reduced erroneous reports of enemy locations forwarded in spot reports. The Apache's FCC quickly determined unit positions with pinpoint accuracy. Both the multiple integrated laser engagement system/air ground engagement system (MILES/AGES) and the aircraft's neodynium laser worked well for range finding.

The desert dust and vehicle-generated smoke affected AH-64 employment. Selection of battle positions minimizing dust was important because of dust effects on the visionics and the laser. The FLIR saw through most battlefield smoke with minor degradation even when DTV or DVO could not see the target. Aviators could not determine the effects of smoke on the Apache's neodynium laser. However, the FLIR was degraded by obscurants.

AH-64 unit leaders must consider battlefield obscurants during mission planning. Aviators need to include obscurants for the mission, enemy, troops, terrain and time (available). Aviators need this information to know how obscurants affect the AH-64's visionics. Pre-mission planning

AH-64 Apache and an OH-58D Kiowa.

"Don't send an entire troop of AH-64s to defeat a regimental forward security element or advanced guard when two troop aircraft can do the job."

should include wind speed and direction, threat-generating capabilities and location of friendly smoke before employment. Properties of smoke, such as density, cause battle positions to move closer or upwind.

Combined. Arms Operations. The successful integration of the Apache with other assets of the combined arms team is difficult. Combined arms operations are often a weakness in aviation units. NTC is the best place for soldiers to practice combined arms operations.

Engagement areas (EAs) are part of the combined arms operations. Attack helicopter EAs should be coordinated with ground unit EAs. By using the AH-64's range capability, the commander could completely cover an engagement area with direct fire weapons systems. The desert terrain offered few places for the enemy to find cover and concealment. Desert wadis were consistently used for cover. Ground forces could not target these areas with organic direct fire. AH-64s could effectively reach these wadis from battle positions in ridgelines more than 6 kilometers away.

Using the Apache in deep operations helped the ground commander influence the battle early. After the first two battles, the AH-64s could go deep, hit the enemy and return safely. The Apache would swiftly move down the ridgeline parallel to the axis of advance. Then the Apache would engage the main body well before it entered into the battle.

After a battle in which the AH-64s successfully attacked, many members commented about the OPFOR. Not one of them had even seen the AH-64s in the battle. Their focus was riveted forward—they did not notice the attack helicopter company, 6 kilometers to their flanks, firing away at the march column unchallenged.

The Apache's intrinsic speed and station time aided the commander in getting the attack helicopters to the battle at the right time. The desert terrain offered many high speed air corridors where the AH-64s could fly maximum torque and still remain masked. The high speeds allowed attack units more margin to correctly time the attack.

Task organization is another part of the combined arms operations. Commanders must be prepared to task organize the AH-64 battalion to fit the mission. Two AH-64s carrying 16 HELLFIRE missiles each can bring tremendous firepower on the enemy. Commanders can benefit from these *lesson learned:* Don't send an entire troop of AH-64s to defeat a regimental forward security element or advanced guard when two troop aircraft can do the job.

One asset to consider with the task organization of AH-64-equipped units is the OH-58D. On the mission, the OH-58Ds were tasked organized with an AH-64 company. This task organization can work extremely well. The OH-58D can find and fix the enemy, hand off the target by laser and even provide terminal guidance for the Apache's HELLFIRE missiles.

Offensive Operations. The role of the Apache changes when the ground forces are on the offense. The AH-64 does not work well against a prepared defense. A dug-in enemy is hard to find, hard to track and hard to kill. The AH-64 must wait until ground forces move the OPFOR. The attack battalion commander best summed up this *lesson learned*: Use the Apache only on the offense to exploit success or prevent failure. Only when we can

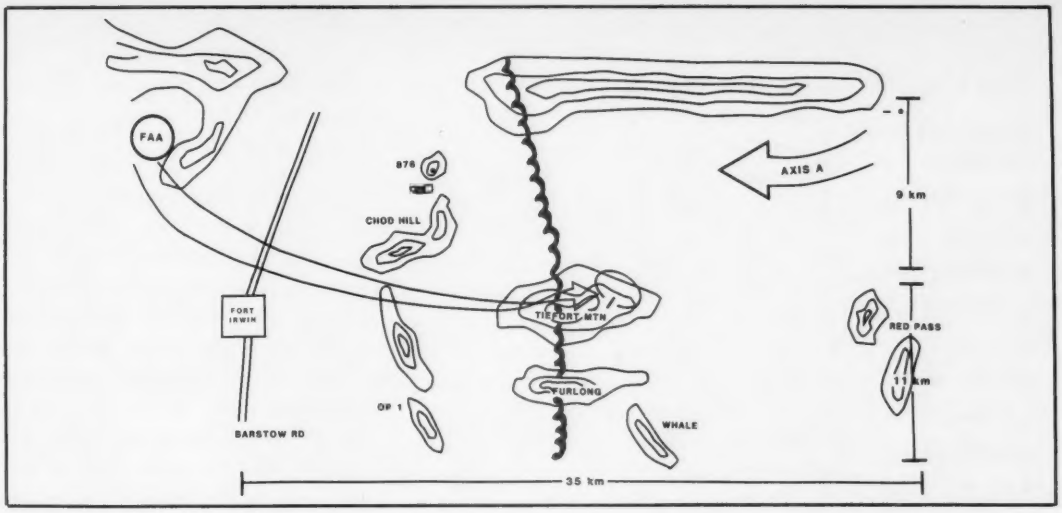


FIGURE 1

get enemy forces out of their holes can we kill them.

More AH-64s were lost supporting ground offensive missions than any other mission. This was due to the difficulty in finding the enemy until the aircraft were within the OPFOR weapons range. Sagger missiles and small arms weapons were the systems getting the kills.

Defensive Operations. The AH-64 works well on the defense. Using the defender's advantage, the unit can reconnoiter and select battle positions, routes, engagement areas and alternate positions. One consideration of reconnaissance is scouts selecting nondusty areas. Another value of a good reconnaissance is the unit can select battle positions so that the AH-64s are employed at the maximum standoff range.

Survivability

The AH-64 proved to be a survivable weapons platform. This was due to standoff range, speed and terrain to mask movement. During mission planning, battle positions were carefully planned to avoid possible enemy locations. During the majority of the missions, not one AH-64 was lost to enemy fire.

With the type of terrain at Ft. Irwin, forward line of own troops (FLOT) penetration by envelopment was successful. Fire, stealth or envelopment accompanies FLOT penetration (figure 1).

Notice the rugged high ground above the wide valley floor. This terrain routes the AH-64 around likely avenues of approach. Air defense artillery (ADA) vehicles have difficulty moving into steep terrain. Threat doctrine dictates that ADA will stay with the advancing armor. These ridgelines provided cover for the AH-64 company to move behind enemy lines, engage the enemy and get out.

Enemy ADA has little impact on the battlefield at NTC; ADA systems are not a major part of OPFOR. All of the AH-64s hit during the force-on-force battles were downed as a result of direct fire weapon systems. The AH-64s came too close to enemy battle positions.

Aviation survivability equipment, like the ALQ-144 or ALQ-136, is not part of the MILES system and was not

"Use the Apache only on the offense to exploit success or prevent failure. Only when we can get enemy forces out of their holes can we kill them."

played at NTC. NTC has no way to determine how well these systems will work.

Dust Signature. The primary cue that gave away the battle position was dust signature. Crews could see the dust kicked up by the AH-64 more than 10 kilometers away. The OPFOR soldiers stationed at Ft. Irwin say the easiest way to find the helicopter is by its dust signature. Sparsely vegetated and rocky areas are the best desert terrain for minimizing dust. Selecting a firing position with minimal dust is critical if one wants to survive.

Fire Support

Field Artillery. Some of the most valuable training for rotating units comes in planning and coordinating fire support. In live fire, only the units' fire support control measures prevent rounds from landing in the battle position. Two fire support *lessons learned* were the value of preplanned targets and the need for good communication.

In tomorrow's fast-paced battle, preplanned targets may be the only way to bring fire on a target. Voice communication from AH-64s to the fire direction center (FDC) was often broken or unreliable. The lack of a digital message device in the attack table(s) of organization and equipment (TOE) restricted the aviation commander (AC).

Often, the AC could not get a call for fire support from the artillery battalion FDC. The AC competed for fire with other units that communicated digitally. Using preplanned targets shortens the call for fire and speeds up processing time. The target is already in the tactical fire computer and can quickly be farmed to one of the firing batteries.

Close Air Support (CAS). The Apache's laser and Air Force laser designator weapons system were not used together; however, soldiers benefited from valuable *lessons learned* during CAS operations. The mountainous terrain of the NTC often prevented the AC from talking with the CAS sorties—until the CAS unmasked to gain the target. As a result, the forward air controller relayed all target information during the JAAT.

Another *lesson learned* was in integrating the field artillery into the battle. All radio calls went through the battalion and battery FDC to the platoon to fire. The process was not responsive enough. The AC must coordinate with the fire support coordinator (FSCOORD) before the JAAT. The FSCOORD needs to arrange for a dedicated battery during the JAAT and work out ways to talk with that battery. This seemed necessary for a successful JAAT.

AH-64 Apache.

photo courtesy of McDonnell Douglas

Combat Service Support

Many support problems develop during a large-scale deployment. Two areas to highlight on service support are AH-64 maintenance and forward arming and refueling points (FARPs).

Maintenance. Maintenance personnel learned many lessons about supporting the AH-64 in a desert environment. The most prevalent maintenance problem at NTC was fine sand ingestion. Sand ingestion primarily affected the pressurized air system (PAS). Eleven different aircraft systems use pressurized air. Sand caused failure of onboard systems that use pressurized air, like the air turbine starters and fuel boost pump. PAS-related failures accounted for 26 percent of the nonmission-capable time. Sand or dust would get into the PAS, clog critical parts and dramatically reduce component life.

Another repeated failure was clogging of the filter from the shaft driven compressor (SDC). This filter would clog and cause the start valve to stay open. Then adequate air could not get to the starters. A quick fix to this problem: place an automobile air filter over the SDC air inlet. This prefiltered the air before it entered the SDC.

The fine sand of the Mojave Desert got into other components, too. Engine health indicator test checks ran high, making frequent flushes necessary. Sand coated the visionics, reducing their performance. Various situations made it difficult to keep the aircraft flying: the lean TOE, short daylight hours, repeated component failures and harsh desert conditions. This particular rotation was in the summer. The high summer temperatures are a greater challenge as the heat leads to cases of "black box" overheating and laser malfunctioning.

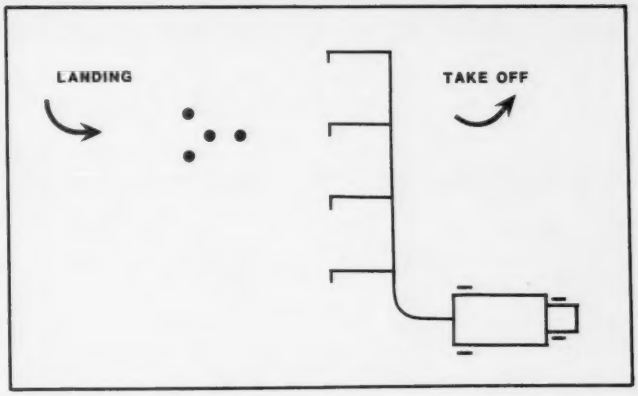


FIGURE 2

FARPs. Refueling operations at the NTC showed the advantages of the drive though the FARP. Dust affected tactical operations and maintenance and created a safety hazard (brown out). To reduce dust in the FARP, aviators must plan their approaches to the ground with minimum hovering and execute rapid take-offs. A pull in/back out type of setup helps desert FARPs. A drive though the FARP (figure 2) allows aircraft to reduce dust problems.

Summary

The Apaches' debut at the NTC was impressive. Everyone learned not only from what the Apache did, but also from seeing how it could do better. The aviators also learned how other members of the combined arms team interacted with the AH-64. The MILES/AGES was a disappointment, because it currently does not duplicate the laser's range and capabilities. Had the MILES laser duplicated the aircraft, some of the ground battles might not have even taken place. The AH-64 was in position to stop the column many kilometers from the FLOT.

The aviation community can build on these *lessons learned* to prepare to fight and win.

Climatic Effect on First Aid Kit Components

What may be expected of first aid kit components when exposed to high and low temperature extremes follows:

Ophthalmic ointment. If it freezes, thaw it out slowly. Do not put it in boiling hot water or expose it to flames (holding it over a match). It does not lose its potency on freezing. However, it can be exposed to elevated temperatures for only a short duration of time, and still retain its potency. Any extended exposure (4 to 6 weeks at one time) to high temperatures will degrade the sulfacetamide ophthalmic ointment so it cannot be used. In either case, before using, carefully knead the tube between the thumb and the forefinger so as not to rupture the tube. Open the tube and squeeze out a small portion to clear the pointed tube end of the ointment. Then use carefully, applying a small amount of the ointment. Remember the medical personnel are going to have to clean the ointment out of the eye or eyes before they can see what damage has been done. Then apply eye patches to both eyes. This will immobilize both eyes. Do this even when only one eye has been injured. This will keep the injured eye from being damaged more by eye movement.

Providone-iodine topical solution. At temperatures below 0 degrees Fahrenheit (F), the solution will freeze, but will retain its potency upon thawing. If exposed to elevated temperatures (110 degrees F or higher) for several days, the product gradually will lose its potency.

Skin closure adhesive surgical and adhesive tape surgical. These two products can withstand temperatures down to -100 degrees F and still be usable with no effect on their shelf life. However, at this low temperature, the tape and skin closure must be warmed up or the products will not stick to the skin.

Ammonia inhalent solution. This product is packaged in very thin glass ampoules surrounded with cotton mesh. When frozen and then defrosted, the solution does not lose its potency. If exposed to high temperatures, the glass vial can shatter. The cotton then absorbs the ammonia solution which evaporates.

Mr. Gerald S. Rosenberg, Resident Pharmacist, Directorate of Medical Materiel, Defense Logistics Agency, Philadelphia, PA, supplied this information.

L119 Foliage Penetrating Flares (National Stock Number (NSN) 1390-00-490-7362).

The U.S. Army Armament, Munitions and Chemical Command (AMCCOM) has advised us that the supply of L119 flares is limited again. The data bank shows these flares are for survival use only. Therefore, requests for large quantities cannot be filled. Keep requisitions to less than 30 kits. Please do not keep reordering 30 kit quantities or less to fill your needs, as this will aggravate the supply situation.

AMCCOM has no input from using activities for training use of these flares. Now it's your turn to help! Provide your ammunition supply point with your L119 training needs. For fiscal year (FY) 1990, it's too late. For FY 1991, it may also be too late—but provide this important information any way. For FY 1992, make certain that your training needs for the L119 are known. Please do not balloon your needs. You may cite Army Regulation 95-3, *Aviation: General Provisions, Training, Standardization and Personnel Management*, as your requirement document for using the L119 for training. AMCCOM recommends that L119 flares be used for live training and then familiarize using the L119 launcher. The correspondence office symbol at AMCCOM is ATTN: AMSMC-DSD-AS.

Microphone M-169/AIC (NSN 5965-01-233-0771, Part Number 973-0604) for MBU-12/P Oxygen Mask

This microphone yearly shows signs of material fatigue, exhibited as stripped threads in the screw holes of the mounting block. Initial installation and reinstallation during periodic maintenance according to Technical Manual 55-1660-247-12 can prevent this from occurring. Avoid applying excessive torque to the mounting screws. The microphone mounting block currently is designed so that continued tightening of the screws, after the matting surfaces have bottomed out, does not apply increased sealing pressure at the mask opening. Continued tightening of the screws serves only to strip the plastic threads and reduces the amount of sealing pressure applied to the mask opening. Aviation life support equipment (ALSE) personnel should only tighten the screws to the bottoming out or snug condition. This should provide enough sealing pressure at the mask opening to give proper leak resistance.

Future M-169/AIC microphones will require threaded metal inserts in the mounting blocks, which will prevent recurrence of this problem.

ALSE technicians handling the microphone assemblies and masks during the required 30-day, as well as preflight, inspections should be aware that the screws used in installation are the thread-cutting type. Special care must be taken to ensure the screws are following the original threads. Apply light pressure on the screws while rotating them counterclockwise, until you notice the screws dropping into the original threads. At that time change the rotational direction to clockwise. This will allow the screw to engage the original threads and track accordingly. This care will prevent repetitive recutting of new threads and removal of material causing stripped threads in the microphone mounting block.

The point of contact is as follows: Product Manager, Aviation Life Support Equipment, ATTN: SFAE-AV-LSE (Mr. James Dittmer), 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798.

If you have a question about personal equipment or rescue/survival gear, write PEARL'S AMC Product Management Office, ATTN: AMCPM-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798 or call AUTOVON 693-3573 or Commercial 314-263-3573.

U.S. Army Class A Aviation Flight Mishaps

	Number	Flying Hours	Rate	Army Fatalities	Total Cost (in millions)
FY 89 (through 31 August)	27	1,521,385	1.77	31	$103.5
FY 90 (through 31 August)	28	1,554,175	1.80	33	$118.2

AVIATION MEDICINE REPORT
Office of the Aviation Medicine Consultant

PLS: Taking the Search out of Search and Rescue

Captain Steven H. Chowen
Medical Service Corps
U.S. Army School of Aviation Medicine
Fort Rucker, AL

THE U.S. ARMY currently is fielding a system to locate downed flight crews—the Personnel Locator System (PLS), AN/ARS-6 (V). This system works with the AN/PRC-112 survival radio to provide accurate data on downed pilot distances and bearings. The PLS will revolutionize the rescue of downed aircrews by greatly improving the accuracy of their location and minimizing recovery time.

Background

Combat search and rescue (SAR) in Vietnam identified a need for improved rescue capabilities. Visual search patterns and voice communications required lengthy exposure times and often alerted the enemy to the location of the downed aircrew. The Department of Defense recognized this need and directed a triservice survival avionics program.

The U.S. Air Force led the way and, in the early seventies, developed the Survival Avionics System (SAS), AN/ARQ-46. This system could locate six downed pilots simultaneously in all weather conditions, day or night. However, the system's excessive weight and high cost proved too much for the Army, and prompted the Army to withdraw from the SAS program in 1981.

The Army, unable to support a dedicated SAR fleet, initiated the PLS program in June 1981. The program developed a new SAR avionics system that is lightweight and easily installed or removed from aircraft. Aircraft identified to receive the PLS are the UH-1 Huey and UH-60 Black Hawk. Current fielding plans call for equipping all aeromedical evacuation aircraft and a portion of the utility fleet (1 per 15 combat aircraft supported) with the PLS AN/ARS-6 (V).

Secure Operations

The PLS works with the Army's new aircrew survival radio, the AN/PRC-112. The AN/PRC-112 is about the same size as the AN/PRC-90 and weighs slightly more (28 ounces). Five selectable frequencies for operation are very high frequency and ultra high frequency (UHF) guard (121.5 and 243.0 megahertz (MHz)), 282 MHz and two other programed frequencies in the 225 to 299.975 MHz range. The AN/PRC-112 provides the option of selecting some 3,000 different channels. This ability to vary SAR frequencies gives downed aircrews and SAR aircraft a greater ability to evade enemy detection.

The AN/PRC-112 acts as a covert transponder until interrogated by a burst of pseudo-random noise from the airborne AN/ARS-6. The AN/PRC-112 responds with a six-digit identification code entered by a calculator-size programer that plugs into its battery port. This spread spectrum burst transmission identifies the crew on the

ground and gives an azimuth and slant range to the survivors' location. The entire transmission takes just 608 milliseconds (ms), making detection or jamming virtually impossible. Another survival radio receiving the same transmission remains on standby until interrogated by its own code.

The PLS AN/ARS-6 (V) stores up to nine survivor codes entered by the flight crew. The AN/ARS-6 searches for the AN/PRC-112, using either the continuous burst mode, interrogating every 650 ms, or the single burst mode on pilot command. The continuous burst mode makes both the searcher and the downed crew more susceptible to enemy detection. A high-threat environment will require use of the single burst pilot on command mode.

Location of downed crews may require the SAR helicopter to climb briefly to altitude, interrogate the downed crew's AN/PRC-112 and return to nap-of-the-earth contour flight for safer penetration. The SAR helicopter crew can interrogate more frequently as they get closer to the downed survivors. Amplitude modulation voice communication will verify the identity of the AN/PRC-112 operator. Although these continuous transmissions are easily intercepted, the close range between the AN/ARS-6 and the AN/PRC-112 will degrade enemy jamming capabilities.

Capabilities

The PLS maximum line-of-sight range is 100 nautical miles (nm). It is accurate to within 1 percent of the distance from the target at ranges greater than 1 nm. The PLS provides accuracy to within 60 feet at ranges less than 1 nm.

The PLS provides two-way UHF voice communication and can provide direction-finding steering to any continuous beacon signal. These features allow the AN/ARS-6 to interact with the Army's current survival radio, the AN/PRC-90.

The cockpit display of the PLS is a liquid crystal readout that provides slant range to the AN/PRC-112 in nm until a distance of 9,999 feet, when it displays the range in feet. A slant range equal to the helicopter's altitude means the AN/PRC-112 is directly below.

The steering command uses a bar graph display with a 10-bar increment. The steering bars are not calibrated in specific increments, but they cover roughly 45 degrees to each side of the aircraft's nose. The number of bars either to the right or left of center provides a sense of relative direction to the AN/PRC-112. When the PLS locates a direct course to the downed crew, the bars disappear and a circle is displayed.

Controls and Installation

The AN/ARS-6's compact control/display unit contains a keyboard and backlit liquid crystal display that is compatible with night vision goggles. The display shows built-in test sequences, codes and frequencies entered on the keyboard. The control/display unit replaces the second frequency modulated radio in the center console of the UH-60 and UH-1. A remote display unit on the main instrument panel shows range and steering graph readouts.

The design of the PLS allows for easy installation with few aircraft modifications. Tests revealed that installation of the AN/ARS-6 (V) took 30 minutes using aviation unit maintenance level personnel and procedures.

Reliability Tests

The Army tested the PLS in arctic, desert and jungle environments at the worst times of the year. Interim tests results showed a 90 percent target acquisition rate during 350 test missions flown. Success criteria for the tests were target pickup on the first pass and the rescue helicopter within 25 feet of the downed crewmembers.

The PLS dramatically increases the capabilities for rapidly locating and recovering downed aircrews. These capabilities increase aircrew survivability on the modern battlefield.

The Aviation Medicine Report is a bimonthly report from the Aviation Medicine Consultant of TSG. Please forward subject matter of current aeromedical importance for editorial consideration to U.S. Army Aeromedical Center, ATTN: HSXY-ADJ, Fort Rucker, AL 36362-5333.

R-15 (Bell)

In 1948 the "R" designation was changed to "H."

Army Aviation Policy

1945 to 1950

This is the second in a series of articles on the history of Army Aviation logistics from 1935 to 1961. The first article, "The Army Ground Forces and the Helicopter, 1941 to 1945," May/June 1990, provided an overview of the early use of the helicopter and the Cook Board report that advocated a powerful Army Ground Forces with its own tactical air force. This reprinted article outlines the actions that followed the establishment of the Cook Board.

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St. Louis, MO

ABOUT THE SAME time, June 1945, that the Cook Report appeared advocating a powerful Army Ground Forces (AGF) air arm, the Army also advanced its plan for the postwar "unification" of the armed services under a powerful secretary of defense. When the Navy countered, in October 1945, with its own plan calling for weak overlordship by a group of committees, the Army, to mollify the Navy, perforce renounced any new nontellurian ambitions.

An immediate casualty of this defensiveness was the pretentious Army air arm. On the eight day of the very month that the Navy plan appeared, the War Department formed another War Department Equipment Board. Presided over by General Joseph W. Stilwell, the board included Lieutenant General (LTG) Lewis H. Brereton, two other lieutenant generals and one brigadier general.[1] Its report appeared 19 January 1946, or 1 day less than 7 months after the Cook Report.

Stilwell Report

Limited Army Aviation Role

Unification had done its work well. The Cook Report's lengthy air arm proposals vanished. Army Aviation was now a seven-page subject, and it was to remain a Cub-type outfit with a very restrictive agenda:

"1. Air support is air power employed in direct furtherance of the ground effort of a particular command. Air support missions include air reconnaissance beyond the capabilities of the ground commander, securing control of the air above the supported ground unit, and fire support against

[1]MG R. H. Christie, Adjutant General, WD, to Each Officer Concerned, 8 October 1945, subject: Appointment of War Department Equipment Board.

ground targets by means of weapons mounted on or carried by aircraft.

"2. Fire support...[must take into account] enemy aviation...[and] ground targets—high performance [aircraft are] always needed and [must be] carefully coordinated.

"3. Air support missions involving the use of high performance aircraft, in general, should remain a responsibility of the AAF [Army Air Forces].

"4. The AGF should be provided with organic light aircraft capable of providing limited observation and transport and of operating from small, unprepared landing strips in forward areas.

"5. Infantry, Cavalry, Field Artillery and Armored units, and various command echelons and installations from division to army [sic], require organic light aircraft, operated by AGF personnel for the accomplishment of the following missions:

a. Close-in observation.

b. Battlefield reconnaissance, both visual and electronic.

c. Adjustment of fire of short range field artillery, rockets and guided missiles.

d. Control and liaison.

e. Local courier and messenger service.

f. Limited aerial photography.

g. Individual and group transport, evacuation of casualties and emergency supply within the command area."

Organic Aircraft

A limited agenda required few aircraft types:

"a. Light liaison aircraft, both fixed wing and rotary wing types. These aircraft should be of the lightest practical weight consistent with all metal construction...[simple, unprepared, 2 to 3 hours of flying time at 80 to 95 miles per hour [mph], with folding wings for highway driving].

"b. Two or three-place liaison aircraft, both fixed wing and rotary wing types...[with the same characteristics except for 3½ to 4 hours' flying time]."

Deleted from the final version were two other types, both fixed wing and rotary wing. These were transport aircraft, one with a 1,000- to 2,000-pound payload, the other with a 2,000- to 6,000-pound payload for cargo, passenger or ambulance missions in all weather.

Army Air Forces—Missions and Aircraft

The AAF had five ground support missions:

"a. Denial of the combat area to hostile aircraft and screening from hostile observation the area occupied by friendly troops.

"b. Collection of information by visual, photographic, and electronic means.

"c. Destruction or neutralization of all types of ground targets capable of affecting the operation of the Ground Forces.

"d. Adjustment of long range fires beyond the capabilities of the organic means of ground troops.

"e. Support of ground operations by providing transportation for airborne troops, supply and evacuation."

Four types of AAF aircraft were necessary for ground forces support:

"a. Tactical reconnaissance types, to provide visual, tactical and electronic reconnaissance and to adjust long range fire.

"b. Fire support types, for use of the AAF in the destruction or neutralization of hostile forces, activities and installations affecting the current operations of the ground commander.

"c. Transportation types, to carry airborne troop units and their equipment and supplies, and to effect strategic supply movements in rear areas and from areas to the combat area.

"d. Photographic types...."

Supporting gear for the aircraft types listed included such items as radios, radar, television, and bombing and target marking devices.

Future developmental aircraft for which there were requirements for were 4-ton assault gliders, a "flying crane" helicopter for ship-to-shore cargo unloading, a 10-ton and a 50-ton transport aircraft, and, what now seems curious, kits that would convert tanks, armored cars, trucks, and such equipment into gliders.[2]

McClain and Hodge Reports

By curtailing the parameters of Army Aviation equipment, the Stilwell Report had also cramped its role and, more important, its possibilities. Throughout the rest of this interwar time, Army interest in aviation almost exclusively confined itself to two subjects. First and foremost was airlift, particularly strategic airlift, with a concomitant concern about C-82s, C-119s and large gliders. The other topic was the replacement of the L-4 Grasshopper and the L-5 Sentinel fleet with the most recent all-metal commercial airplanes.

Appearances of the McClain and Hodge Reports in 1949 and 1950, respectively, offered little change from the Stilwell nonpronunciamentos. The main, but still insignificant, deviations were a halting recognition of technological developments and an interest in participation in the design of Air Force support aircraft. The McClain Report, especially, took note of the latter.

McClain Report

Formed on 14 June 1949, the McClain board consisted of LTG Raymond S. McClain, 2 brigadier generals and 19 others.[3] Entitled *Simplicity-Mobility-Adequacy-Economy*, the 74-page report devoted 33 lines to Army Aviation. These lines, which discussed needs, divided roughly equally among the three standard aviation sections shown in all four reports.

• Aircraft. In order to obtain aircraft that were armored, very fast, very high flying and capable of bombing in all weather "...certain types should be earmarked for development along lines more commensurate with the role of tactical support of ground operations. In addition, emphasis should be given to the continued development of cargo aircraft...."

• Airborne Equipment. "An evaluation of Army and Air Force development should ensure...[that] all equipment of standard Infantry and Airborne divisions and all other ground force equipment be transportable.... To attain this airtransportability [sic], a bold compromise between ground forces equipment and aircraft design should be achieved in the development phase by coordination between Army Field Forces and the United States Air Forces [sic]."

• Airborne Support Equipment. "Fire support by air weapons should be available against enemy aviation overhead and against ground targets interfering with the ground force mission whenever the air situation permits. However [sic], high performance air reconnaissance is required by ground elements regardless of the status of the air battle...air fire power...[should be coordinated] with the fire plan of the ground front as a whole, and provision [should be made] for extensive liaison and communication facilities between ground and air commands concerned. The problem of providing satisfactory air-ground communication should be vigorously pursued to completion by both the Army and the Air Force."[4]

Hodge Report

Even while the McClain Report was taking shape, the Hodge Report was underway. The latter took its name from its chairman, LTG John R. Hodge, who had the assistance of two major generals and four brigadier generals.[5] The Hodge Report was lengthy and consisted of two parts, the first and major portion treating mission and equipment, the second, a collection of appendices, discussing improvements and refinements in design.

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[2]General Joseph W. Stilwell, President, WDEB, to General D. D. Eisenhower, CSA, 19 January 1945, subject: Report of War Department Equipment Board, pp. 40-41, 56-60.

[3]Letter, COL L. V. Warner, AG, OCAFF, 14 June 1949, to Each Officer Listed, subject: Establishment of Army Equipment Policy Panel.

The first helicopter obtained for Army Aviation evolved from the YR-13 in 1946; which was developed from the Bell Model 47 (top); which became the H-13B in 1949 (middle); modified with skids in 1951 as the H-13D; and later became the OH-13 (bottom).

Army Aviation Policy, *continued*

The main focus of the report was rapid mobility, especially strategic airlift:

"8. It is necessary that the Army develop a high degree of strategic mobility by means of airlift combined with waterlift in order that rapid developments may be executed....

"12. Airborne combat operations have introduced another vital... [aspect] of tactical mobility. While progress in research and development has been made in this field since World War II, a definite Army program of requirements, coordinated with the Air Force, is needed to give input to field testing and procurement of equipment."

Among various urgent needs, the report notes:

• "*Helicopter.* There is a requirement for a single place helicopter of not more than 200 pounds empty weight and collapsible so that it may be delivered by parachute to provide observation during the early stages of airborne operations."

• Transport aircraft—10 and 25 ton.

• Assault gliders.

• Cargo aircraft, for landing on earth or water, dividing into:

—An 8,000-ton cargo-carrying capacity aircraft with a range of 200 nautical miles (nm).

—A 'flying crane' helicopter with a 20,000-ton capacity and a 100-nm range.

—Another 'flying crane' with a 50,000-ton capacity and a 100- nm range."

The board saw the gliders, cargo aircraft and flying cranes as Air Force support items, and it, therefore, did not advocate an increase in the current nine functions of Army Aviation:

"a. Maintaining aerial surveillance in forward areas for the purpose of:

(1) Locating appropriate targets.

(2) Adjusting fire.

(3) Obtaining information on hostile forces.

b. Aerial route and terrain reconnaissance.

c. Control of march columns.

d. Camouflage inspection of ground forces areas and installations.

e. Local messenger and courier service.

f. Emergency aerial evacuation.

g. Emergency wire laying.

h. Limited aerial supply.

i. Limited front line aerial photography."

Little chores meant little aircraft, or ones "...light, simple, easy to maintain..." and capable of cruising "...600 feet at sea level or more than 1,000 feet at 10,000 above...." To meet such needs, the board envisioned two fixed wing types and two rotary wing types:

"b. *Fixed Wing Aircraft.* Due [sic] to lower initial cost and simplicity of design [these] are presently used in the majority of operations...[and, therefore, for these] there is a continuing requirement:

(1) A two place observation type stressing all around visibility and slow observation speed, with a minimum of three hours' endurance. High [sic] rate of climb, which is essential to the success of this airplane.

(2) A utility airplane stressing interior dimensions sufficient to accommodate two litter patients on standard Marine Corps stretchers or other combinations of loads up to 800 pounds in weight. This airplane must have a minimum of 4 hours' endurance.

"c. *Rotary Wing Aircraft.* This type of aircraft shows great promise for Army use and research and development effort should be focused on improvements and jet helicopter development. Its most serious current defects, which must be eliminated, are high initial cost, excessive maintenance and lack of provision for night and poor weather flying. The following types of organic rotary wing aircraft should be procured:

...(1) A single place helicopter of not more than 200 pounds...

(2) A dual role two and four place helicopter whose performance when flown with only two occupants will be adequate for observation missions. The same helicopter should have the ability to carry the pilot and two litter patients and a medical attendant or other combinations of payloads up to 800 pounds. This helicopter to be suitable [sic] for the support of emergency survey operations as an expedited means of obtaining pin point control in triangulation for mapping."[6]

Policy Review

Peace, fiscal astringency, and the need to present a solid unification front to the Navy joined to throttle the wartime AGF's Army air arm aspirations. Perhaps, too, the much talked about antiair conservatism of some senior Army generals came into play when the Air Corps left the Army. The consequence was a minimal Army Aviation undertaking. Nevertheless, the ideas, or perhaps even the ideal, of a big, competent air arm of its own lurked somewhere in the background of the Army's mind, awaiting only the exigencies of another war to spring to the fore. With containment the national watchword, it would not dally long.

For the nonce, however, the aviation section of the Army brain could only slowly churn. Even in this quietus, though, thoughts haltingly emerged. The Flying Crane, Flying Tanks and Tank Destroyers, and the notion of shared design to produce dedicated Army support aircraft surfaced in the three interwar reports. All would take form in about two decades—the Flying Crane, as that name, in the 1959 S-60; the Flying Tank Destroyer, as the AH-1G in Vietnam in late 1967; and dedicated Army support aircraft design, when, on 1 July 1960, the Deputy Secretary of Defense granted the Army the authority to prepare its own aircraft specifications.

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[4]Letter, LTG R. S. McClain, Chairman, to CSA, 12 August 1949, subject: Report of the Army Equipment Policy Panel.

[5]As with the Cook Report, the author assigned the names of the chairman or president of each report to the report itself; hence, the terms Cook, Stilwell, McClain and Hodge Reports are his concoction. The reports, to remind the reader, discuss all types of Army equipment.

[6]LTG John R. Hodge, Chairman, Report of the Army Equipment Board, Washington, DC, 8 March 1950, pp. 7, 10, 79-85, 88.

ATP THE COMMANDER'S TOOL

Captain Roger Waters
Chief, Aeroscout/Attack Branch
Directorate of Evaluation and
Standardization
Fort Rucker, AL

THE Aircrew Training Program (ATP) is more than a regulatory requirement needed to pass an inspection: it is the commander's tool to train and prepare the unit for combat and peacetime missions. I am a former attack company unit commander and current member of the Directorate of Evaluation and Standardization, U.S. Army Aviation Center, Ft. Rucker, AL. From experience I know many commanders view the ATP as a paperwork drill. I would like to share with commanders some thoughts and suggestions to broaden their perspectives about the ATP.

Commanders often disassociate their unit training programs and ATP. They are the same. I feel this perception is an awareness problem and, therefore, easily correctable. A major reason for the separation of the unit training program and the ATP is a result of our officers' formal training. Neither at the commissioned officer nor warrant officer level of training do we have specific guidance for the ATP development and application.

This does not say our officers do not receive detailed and continuous instruction on how to train; we do at every level of formal schooling. However, the training is not geared toward the specific requirements of aircrew training. The commander correlates school training and practical experience into the ATP development and supervision. If done correctly, the ATP will be a functional and practical document to help train a unit for war.

In the development of the ATP, the commander, as the manager, must be intimately involved. For instance, the scope of command involvement will determine the quality and effectiveness of the program. The ATP should be the foundation upon which the commander develops and conducts mission training. The commander should use all available resources to help formulate the ATP. The most valuable resources are experienced instructor pilots (IPs).

Since the advent of the J-series table(s) of organization and equipment, the experience level of a company commander has been reduced. Although the assets for which a J-series commander is responsible are less than the H-series assets, the ATP responsibility remains the same. Many company commanders are junior captains fresh out of the advanced course. Unless new commanders are blessed with an "old pro" who takes them under their wing, they will struggle through

the ATP development and administration.

When I was a young commander, no one could have convinced me that I was not prepared. I knew Training Circular (TC) 1-210, *Aircrew Training Program Commanders' Guide*, as well as any IP in my unit; at least I thought I did. I ensured my aviators progressed in the correct timeframes and they met their minimums. That was the extent of my knowledge.

Now that I have a chance to reflect on those days, I have a dramatically different view. I often reflect on those days and say, "If only I knew then what I know now." With that in mind, I would like to share my perspective on how to apply the ATP.

TC 1-210 is also the commander's guide for developing an ATP. The guide is purposely designed as a generic document, usable by the commander of any type or size of aviation unit. This type of document gives commanders flexibility to design their own programs based on unit structure and training requirements. Here are some detailed ATP components.

Task Lists

To develop the ATP, use the principles in Field Manual (FM) 25-100, *Training The Force*. Determine the unit's battle focus and formulate the unit mission essential task list (METL). Also consider any unique peacetime requirements that may not be obvious from your combat mission. From this, identify the critical individual, crew and collective tasks needed to support the METL. This process naturally leads to the individual aviator's or crewmember's task list.

Keep in mind the "keep it simple" principle when developing the list. I have often seen task lists so complicated and confusing they become counterproductive. The task list should clearly indicate the training requirements of the individual crewmember. Structure the task list so even the most junior crewmember can understand it. This understanding by the crewmember is crucial, because the task list is really an order from you to them.

Commander's Evaluations

The first, and one of the most critical, event in the ATP is crewmember integration. Each newly assigned crewmember comes to you with different background, abilities and experience. The commander's evaluation and development of an individual training program will ensure efficient and thorough training. A well developed integration process will set a tone of professionalism and leave a lasting impression with the new crewmember.

The commander can administer a good integration program in many ways, such as checklists and sponsorship responsibilities. Most importantly, however, the commander should write down the procedures as an integral part of the ATP. The integration process should include chain of command involvement.

Readiness Level (RL) Progression

The commander must be involved in every phase of progression. This is one way the commander can assess training posture and verify ATP. Involvement may encompass a variety of subjects. Examples include concurring or nonconcurring with IP recommendations on grade slips; determining the scope of evaluations; and designating extra tasks and iteration requirements.

Despite how a commander decides to manage RL progression, this individual and the staff must remain actively involved. RL progression is a primary vehicle to train the aviator to perform the combat mission. Like the ATP integration—the quality and professionalism shown in the execution of a crewmember's RL progression sets the standard and leaves a lasting impression.

Crew Qualification and Selection Program

The commander should use this program to set standards and criteria for selecting crewmembers for required duty positions. The ATP must state the training required for any crew or duty position. Furthermore, the commander should detail the program so any crewmember can determine specific requirements. The commander must establish a selection program that involves the chain of command, safety personnel, IPs and the most experienced aviators. The assignment of crews on demanding missions is a special area of interest. Involvement of the most qualified and senior personnel in high-risk missions is imperative. This lack of command involvement has been cited in fatal accidents where crews were "in over their heads." These were terrible burdens for the commanders, because these accidents were avoidable.

The most important aspects in the development of this program are to use it to enhance safety and mission effectiveness and to compliment the ATP. The benefits are greater than just meeting a regulatory requirement.

Hands-On Annual Evaluations—Annual Proficiency and Readiness Test (APART)

Mission-ready (RL1) crewmembers receive scheduled evaluations annually. To be effective, these evaluations must extend beyond the Department of Army directed tasks; they must include those tasks deemed critical to the unit's mission. You should carefully review the tasks selected for training and make sure the most critical of these are evaluated annually.

No-Notice Evaluation Program

This can be one of the commander's most valuable tools if properly used to supplement the scheduled APART evaluations. The strength of the no-notice program depends on the ability of the commander to determine the focus of these evaluations. To do this, the commander must set methods to assess training and identify adverse trends. This process will lend to the maximum use of training resources and time and help correct deficiencies or reinforce command items of interest.

A successful program means the commander establishes and clearly communicates expected tasks and standards to each crewmember. The program should incorporate more than just flight evaluations. A good program includes oral and written evaluations that sample applicable subject areas, such as the appropriate operator's manual, threat, aviation life support equipment or aircraft survivability equipment.

The commander should administer an active program according to the ATP. Then the commander can accurately look at individual and crew proficiency and have a tool to help sustain individual and crew training.

Training Scenarios

Commanders should apply scenarios as a method to train units to go to war. They should make the ATP an integral part of unit training plans. Training scenarios should encompass both individual and collective training. Commanders should develop unit scenarios to compliment one another. Individual scenarios are the easiest to develop, since most of the tasks are in the applicable ATM. However, commanders should not get caught up in developing a laundry list; instead, they should use the training principles in FM 25-100.

Commanders should select critical individual tasks that support the METL and ARTEP Mission Training Plan (AMTP). Then commanders should make sure their individual scenarios establish a systematic and logical training vehicle to prepare crews for collective training. Collective scenarios should incorporate team and unit training. Commanders should develop scenarios in five-paragraph operation order format, ensuring they support the unit's METL and AMTP.

Commanders should use collective scenarios for team and unit battle drills. The scope and depth of each scenario is left up to each commander. The important thing is to develop scenarios realistically and within the resource constraints of the units.

Commanders can effectively use unit trainers (UTs) in many ways to support and implement ATPs. Common areas of UT use are NVDs, instruments and gunnery. Another method of using UTs is collective training. The effective use of UTs as collective trainers will allow IPs to concentrate on individual training and to supervise unit and collective efforts.

To make this work, commanders must develop a sound training plan for UTs. Specific qualification requirements must be addressed in the crew qualification and selection program. Commanders should establish systematic procedures for the training and assessment process of a UT.

Leadership is as important as anything previously mentioned. Since commanders ultimately carry the responsibility in the management and administration of the ATP, they must also set the standard according to the document they have established.

Personal priorities, performance and conduct convey a clear message to subordinates. These factors will ultimately make the difference in the overall performance of the unit. A unit's performance in the conduct of training evaluations or in actual combat mirrors the quality of the ATP and unit leadership.

The Third Annual Aviation Noncommissioned Officers Symposium—1990

THE U.S. ARMY Aviation Center, Ft. Rucker, AL, hosted the third annual Aviation Noncommissioned Officers (NCOs) Symposium 25 through 29 June 1990.

Command Sergeant Major Roy McCormes, of the Aviation Center, delivered the welcome address and greetings from Major General Rudolph Ostovich III, commander, Aviation Center, to sergeants major and senior NCOs from throughout the world.

"Army Aviation Warfighting 2000" was this year's theme. It focused on Army Aviation and its role in future AirLand Battle doctrine.

The symposium allowed representatives from Active, National Guard and Reserve Components the opportunity to discuss, exchange and present solutions to concerns from soldiers in the field. The gathering served as a forum whereby leaders were brought up to date on present and future aviation proponency issues, the Army Aviation modernization plan, concepts and initiatives. Also, the conferees were briefed on the impact the budget cuts will have on the mission of Army Aviation in the future.

Some of the key issues presented for discussion were:

- Hardware acquisition programs.
- Adaptation to fighting a threat in a low-to-high intensity conflict.
- Personnel.
- Reduction in institutional training.
- The impact reductions will have on warfighting units' training.
- Methods of fielding new aviation equipment.
- The overall impact Army Aviation reductions will have on Reserve Components.

Attendees were divided into five working groups to study and address key issues and concerns along with recommendations. Group A discussed personnel matters; group B, training institutional issues; group C, training unit issues; group D, sustainment and acquisition; and group E, Reserve and National Guard issues. The results of each group were presented to the overall group and will be addressed at the next aviation brigade commander's conference scheduled for later this year.

Feedback from the field is very important. It gives the "schoolhouse" a yardstick by which to measure its success. Success in training the enlisted soldier is paramount in maintaining the best personnel the Army has to offer. In these austere times of budget cuts, and maintaining mission requirements, only those *outstanding* soldiers have the assurance of always having a job in the U. S. Army—no matter how many cuts are effected.

ATC FOCUS
U.S. Army Air Traffic Control Activity

THE MOBILE MAINTENANCE CONTACT TEAM

Mr. Bobby Reynolds
Area Maintenance and Supply Facility
U.S. Army Air Traffic Control Activity
U.S. Army Aviation Center
Fort Rucker, AL

THE MOBILE maintenance contact team (MMCT) is a branch of the area maintenance and supply facility (AMSF). It provides onsite air traffic control (ATC) maintenance support to all Army fixed-base navigational aids (NAVAIDs) facilities within the continential United States, Alaska, Hawaii, Panama and selected sites in Korea. The team's goal is to provide Army Aviation with the safest and most dependable NAVAIDs available.

The AMSF was established at Ft. Rucker, AL, in 1975. It serves as the intermediate repair facility for ATC-peculiar, nontactical NAVAIDs equipment, and provides repairable exchange on electronic modules.

It may be impossible to repair a specific NAVAID through module exchange or telephonic communication. If so, the MMCT mission is initiated after official tasking by the local airfield commander/director.

MMCT personnel often are asked to evaluate unique problems and situations such as failure to pass routine flight inspections, equipment siting and common electronic problems beyond the authorized maintenance level of onsite personnel.

The MMCT mission requires close coordination with onsite ATC maintenance personnel, as well as Federal Aviation Administration (FAA) flight inspectors, in restoring NAVAIDs to operational status.

If the reason for deterioration of a NAVAID cannot be readily determined, an MMCT member compares the most recent flight inspection report with original commissioning data and attempts to determine the probable cause of NAVAID malfunction.

In most circumstances, corrective action cannot be determined without conducting extensive onsite testing by MMCT with assistance from local technicians and often aided by systems evaluation flight inspection teams.

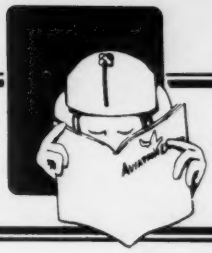
Gradual vegetable growth and new building construction, close to the affected NAVAID, have been the most prevalent causes of low-frequency NAVAID failure during FAA flight inspections. When one of these conditions is discovered, MMCT personnel recommend to the airfield commander or his representative that vegetable growth be cut to meet facility siting criteria or request engineering assistance for building obstructions.

When responding to an airfield NAVAID outage, MMCT personnel are normally dispatched within 24 hours of official maintenance request. The MMCT members discuss the problem with onsite technicians before departure; they hand carry proper repair parts or modules required to restore the affected NAVAID to complete operational status.

The MMCT can be contacted at AUTOVON 558-5413/3494, Commercial 205-255-5413/3494, or FAX AUTOVON 558-3238, Commercial 205-255-3238, on any technical questions or problems related to NAVAID maintenance or equipment outage. We are here to serve the ATC community.

Readers are encouraged to address matters concerning air traffic control to Commander, USAAVNC, ATTN: ATZQ-ATC-MO, Fort Rucker, AL 36362-5265.

VIEWS FROM READERS



Editor:

I have read, with considerable interest and enthusiasm, CPT Smith's article, "Moral Disruption by Maneuver," which was published in the March/April 1990 issue of the *Aviation Digest*. Providing opportunities for exploratory arguments and perspectives should be a major objective of Army journals. I am pleased that you see that objective as an important one.

The concept of a "unit moral envelope" is an intriguing one and worthy of further exploration by those seeking measures of performance other than number of casualties or movement of the forward line of own troops. Acceptable measures are lacking, particularly at the operational level; simple sums of tactical measures are inadequate.

I have difficulty with CPT Smith's reference to the "two pure tactical styles of warfighting...," that is, attrition and maneuver. While both are nouns, it seems to me that they refer to two very different aspects of combat. The first is a measure of objective, effectiveness, or outcome; the second, according to Field Manual (FM) 100-5, *Operations*, is "...the means of concentrating forces...," that is to say, an input to the battle, rather than an output. The two concepts are incommensurable for CPT Smith's purposes.

As a counter, I suggest that two alternative outputs are attrition and suppression, although there is overlap between the two. Some definitions (from the *American Heritage Dictionary of the English Language*, 1969) are useful:

- *attrition (n)*: a gradual diminution in numbers or strength due to constant stress.
- *maneuver (n)*: a strategic or tactical movement.
- *suppression (n)*: the act of suppressing; the state of being suppressed.
- *suppressing/suppressed (tr.v)*: to curtail or prohibit the activities of; refers to exercise of power or control that either brings about extinction or severely limits force or function; implies crushing or restricting drastically in effectiveness.

It seems to me that these mundane definitions give us good points of departure for useful measures of output.

There are not two pure tactical styles of warfare; there are, basically, fire and maneuver as elements that are closely intertwined. Again, to quote FM 100-5: "Maneuver and firepower are inseparable and complementary elements of combat." And, "...fire support helps create opportunities for maneuver. It destroys or suppresses enemy forces...." And, more, "Maneuver units can inflict the greatest damage on the enemy by avoiding head-on encounters with his deployed forces. Instead, they should operate on his flanks and rear, where direct fire is most effective, psychological shock is greatest, and the enemy is least prepared to fight."

I agree with a major premise of CPT Smith's article that whatever the alternative output measure is, we have avoided dealing with it because of difficulties with quantification. Present day simulations require interval measures; casualties can be counted; therefore, casualties (attrition) become a key measure of performance for combat simulations.

There are encouraging signs of change. There are pockets in the Army that are looking at human

behavior in combat, not in terms of psychological measure, but in terms of measures that can be related to the battle and its outcomes. We are not seeking alternatives to attrition measures, but rather complementary measures. Some of us believe that, with changes in the international security environment, will come changes in emphasis on small unit operations and new forms of force projection coupled with different objectives and responsibilities. There will be need for different forms of output or effectiveness measures. In addition, new requirements will focus more attention on individual behavior, smartness on the battlefield, better use of terrain, more attention to deception; in short, smart leaders will win and dumb leaders will lose.

Finally, my long-term heritage as an operations analyst (I was first so designated in 1956) requires me to enter the semantic battle again. Contrary to CPT Smith's observation, the field is not "...a form of battle analysis that concentrates mainly on pure weapons performance and loss rates—it is a tool to study the attrition style of war." A vast array of definitions are available. P.M.S. Blackett, who dates from an even earlier time than I, in his fine collection of essays and reminiscences of World War II (*Studies of War*, 1962; heartily recommended to CPT Smith and his peers), provides one of the most well-known and accepted, that of C. Kittel (United Kingdom): "a scientific method for providing executives with a quantitative basis for decisions." Blackett, in a note written in 1941 to help new analysts assigned to operational research sections, says: "One obvious characteristic of operational research, as at present practised, is that it has, or should have, a strictly practical character. Its object is to assist the finding of means to improve the efficiency of war operations in progress or planned for the future. To do this, past operations are studied to determine the facts; theories are elaborated to explain the facts; and finally the facts and theories are used to make predictions about future operations." Much more recently, the U.S. Army Logistics Management College, responsible for teaching courses covering the tools and techniques of operations research and systems analysis, often referred to as ORSA as though it were one field of endeavor, provides the following: a reasoned approach to problems and decisions; quantitative common sense; the application of quantitative economic analysis and scientific methods to the problems of choice of weapon systems and strategy; an inquiry to aid a decisionmaker in choosing a course of action by systematically investigating alternatives by comparing quantitatively where possible the costs, effectiveness, and risk associated with them, and formulating additional alternatives if those examined are found wanting; studies and analysis associated with high-level problems at or near the national level; an attempt to help decisionmakers by defining those aspects of the problem that can be quantified. Operations analysis is all those things and perhaps more. What it is not is [only] a form of battle analysis!

Keep publishing think pieces such as that of CPT Smith; the Army needs to stretch the minds of its present and future leadership.

Mr. Eugene P. Visco
Director
U. S. Army Model Improvement and Study Management Agency
Office of the Under Secretary
Department of the Army
Washington, DC

Editor:

Kids love choppers! No doubt about it. The helicopter is the single most interesting piece of military equipment—at least to young people living in Missouri.

Missouri Army National Guard aviators get constant requests for aircraft displays or tours of aviation facilities. Thousands visit the Jefferson City aviation support facility each year, many from out of town during a class trip to visit the state capitol. Thousands more each year see a helicopter when it arrives at their town or school for a static display.

Aviators from the flight activity at the Guard and aviation classification and repair activity depot shop in Springfield, brought an aircraft to the nearby town of Willard recently and students from the Willard North Elementary third grade class taught by Mrs. Mary Swann sent back a

"thank you note." Mrs. Swann asked her students to compose short phrases to describe their reaction.

Here is a visit from Army Aviation as third graders from Missouri see it:

- Special kind of learning.
- Really cool.
- Never ending radical thing.
- Interesting exhibits.
- Interesting facts.
- You'll never forget this.
- Everyone participates.
- Exciting.
- Doing daring stuff.
- People help out.
- Totally cool.

Those over 18 years of age should consult with a third grader for the substantive definition of "never ending radical thing."

MAJ Ken MacNevin
Public Affairs Officer
Missouri National Guard

Editor:

I am assembling information concerning the early application of the helicopter to the Territory of Alaska during the 1947 to 1957 timeframe. This includes both civil as well as military. Information, stories, anecdotes and photographs are needed of early Army helicopter operations.

The same material is needed of the 30th Topographic Battalion that officially is known as 30th Engineer Base Topographic Battalion, which operated OH-23A or B and OH-13 helicopters during a 5- to 7-year span.

Good, bad, ugly or indifferent, input is needed to round out the Army's early applications of the helicopter in Alaska from 1947 to 1957.

Also, I need a copy of the first year's report of the 30th Engineer Base Topographic Battalion's report on Alaska survey operations, which may be for the first year, 1947 or 1950.

Mr. David Sternik
13520 Diggins Dr.
Anchorage, AK 99515

Editor:

From 5 through 7 February 1991, the U.S. Army Aviation Association (Mr. Joseph P. Cribbins) is sponsoring the Product Support Symposium in St. Louis, MO. For additional information please contact Ms. Susan Werkmeister, Commercial 314-298-2786.

David W. Keating
Manager-St. Louis Operations
St. Ann, MO

Editor:

In 1989 the project manager for clothing and individual equipment (PM-CIE) purchased and distributed a limited number of finger and lip lights to U.S. Army Aviation units. The PM-CIE also initiated a research and development effort to improve and type-classify the pilot light aids. Completion of the development effort is scheduled for 1991. In the interim, aviation units desiring to purchase additional quantities may procure the devices through local procurement directly from the contractors. The U.S. Army Aviation Systems Command airworthiness release message, dated 5 January 1989, identified the items PM-CIE approved.

The approved pilot light aids may be ordered from the following vendors:

Night Devices, Incorporated
208 Miller Drive
Newton, AL 36352
Commercial 205-598-3223
(lip light (single switch))
(finger light (single))

Seitz Scientific Industries
201 Hickory Bend Road
Enterprise, AL 36330
Commercial 205-347-9713
(lip light (MLII))

Mr. Ed O'Donnell
Directorate of Combats
Developments
Ft. Rucker, AL

Editor:

The 1st Battalion, 10th Aviation Regiment (formerly the 10th Aviation Battalion), Ft. Rucker, AL, is presently in the process of creating a hall of honor depicting the history of the unit. We are in need of any items that will assist us in our quest. Items needed include unit patches, photographs, unit histories, guidons, etc. If you have any items of interest please write to: Headquarters, 1/10th Aviation Regiment, ATTN: CPT White, Ft. Rucker, AL 36362, or call Commercial 205-255-2898/3893, AUTOVON prefix 558.

Readers can obtain copies of material printed in any issue by writing to: Editor, U.S. Army Aviation Digest, P.O. Box 699, Fort Rucker, AL 36362-5042.

AVIATION LOGISTICS
U.S. Army Aviation Logistics School

AH-1F TOW Cobra Hot Mockups

Sergeant First Class Edwin R. Boscana (Retired)
Staff Sergeant Jose O. Davila
Aircraft Armament Division
Aircraft Armament Department
Aviation Trades Training
U.S. Army Aviation Logistics School
Fort Eustis, VA

TRAIN THEM WELL; train them to win the war." These words may have been those of George Washington, our first commander-in-chief, spoken to Baron Von Steuben, the Army's first recognized trainer, when the latter was initially assigned to the Continental Army. Today, this tradition continues at the U.S. Army Aviation Logistics School (USAALS), Ft. Eustis, VA. Ever mindful of its mission, USAALS has added to those words "effectively, efficiently and economically." Sound training, logic, budget constraints and a rapidly changing world prompted the addition of these terms.

To continue these training mandates, USAALS continually is searching for ways to reduce training costs. At the same time, USAALS is increasing realistic, meaningful hands-on training.

In the past, to train the 68J-series military occupational speciality, aircraft armament fire control repairer, USAALS used actual end items of equipment as training aids. This method is expensive (flyaway cost of an AH-1F Cobra is about $5.3 million). Also, it removes flyable aircraft; test, measurement, and diagnostic equipment; and other major end items from the inventory. The AH-1Q TOW Cobra was fielded in the 1975 to 1976 timeframe. Since then, aircraft armament subject matter experts (SMEs) found that, on the average, the cost of maintenance hardware training devices was one-third of the actual end item cost.

To support this fielding, USAALS introduced another training media to armament training—the maintenance training panel. These devices satisfied armament training needs for the AH-1Q and AH-1S TOW Cobras.

Fielding of the AH-1F fully modernized (FM) TOW Cobra posed more training challenges. Maintenance hardware trainers and training panels were updated to the FM configuration, and were adequate for instruction of systems and subsystems.

Even so, USAALS recognized a major training void.

The following systems were added: fire control computer; air data subsystem; rocket management system; heads up display subsystem, redesigned helmet sight subsystem; and the universal turret system (UTS). Their total integration with the aircraft's main weapon system dictated that the interface troubleshooting of these armament subsystems and the TOW missile system (TMS) become an integral part of USAALS aircraft armament training programs.

Countless months of querying industry, the other services and the materiel development community for means to adequately train this required interface troubleshooting followed. The U.S. Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island, IL, was found to have built mockups for their proponent subsystems: one at Rock Island Arsenal, IL, and one at Red River Army Depot, Texarkana, TX. While adequate for subsystems, these mockups did not meet the need for complete end-to-end training. After further investigation, USAALS found that Corpus Christi Army Depot (CCAD), TX, had a complete and comprehensive AH-1F hot mockup. Technicians were using it to troubleshoot, test and repair armament components and subsystems. In 1985, USAALS SMEs, on a training assistance mission, used the hot mockups to train newly hired CCAD technicians. Recent AH-1 readiness issues indicated that increased interface troubleshooting of armament subsystems is required.

Funding, development and logistics issues were addressed and resolved between AH-1 Cobra project manager, CCAD and USAALS. With the help of Mr. Juan De La Cruz, division chief airframe shop; Mr. Jose Garcia, chief aircraft armament section; and their outstanding workforce at CCAD, USAALS anticipates delivery of two mockups in late 1990. Four other mockups will be delivered later. The hot mockups consist of four individual stands as follows:

- The main stand consists of the line replaceable units, switches and controls to operate the armament subsystems.
- The second stand is a working platform for the UTS.
- The third stand is the working platform of the TMS telescopic sight unit.
- The fourth stand is for wing stores, either rocket or TOW missile launchers.

Each stand can be used independently to check subsystems. The stands can also interconnect to allow for complete end-to-end troubleshooting. This versatility can only improve the depth and quality of USAALS troubleshooting training. As an added benefit, delivery of the mockups will return valuable AH-1F Cobra aircraft to the inventory. This is in keeping with USAALS' goal to provide the Army field units high-caliber, cost-effective maintenance instruction.

For further information write Sergeant First Class Edwin R. Boscanna (Retired) or Staff Sergeant Jose O. Davila, at USAALS, ATTN: ATSQ-LTD-TA (SSG Davila), Ft. Eustis, VA 23604-5439; or phone Commercial 804-878-4390.

SAFR: Storage, Analysis, Failure Evaluation and Reclamation of Aircraft Parts Scheduled for Disposal

Mr. Robert W. Ladner
Depot Engineering and Reliability Centered Maintenance
Support Office
Directorate of Maintenance
U.S. Army Aviation Systems Command
St. Louis, MO

SAFR is a new U.S. Army Aviation Systems Command (AVSCOM) program for the storage, analysis, failure evaluation and reclamation of aircraft parts scheduled for disposal. It started 26 June 1989 with a ribbon-cutting ceremony dedicating the new phase 1 building at the Corpus Christi Naval Air Station, TX. This station hosts the largest employer in south Texas, the Corpus Christi Army Depot (CCAD). Phase 1 is the first AVSCOM- owned building on the station.

DERSO Dedicates Phase I SAFR Building. Ribbon-cutting ceremony participants left to right: Colonel William J. Blair, former CCAD commander; Mr. Wesley J. Cass, SAFR project officer; Mr. L. Porter, DERSO facilities engineer; Colonel Gary D. Johnson, AVSCOM director of maintenance; Dr. Lewis Neri, chief of DERSO.

SAFR Goals

The SAFR program was designed to perform final engineering evaluation on expensive flight safety parts that are rejected during maintenance and overhaul programs at the CCAD. The Depot Engineering and Reliability Centered Maintenance Support Office (DERSO) is performing technical evaluation of the material in the new building. Value engineering (VE) and the SAFR program will go hand-in-hand as new and improved repair and inspection procedures are developed for high-cost

and critical items in short supply. VE proposals resulting from the SAFR parts program will create significant savings and cost avoidance.

Parts Reclamation—$$ Saved

The SAFR program reduces costs through reclamation of parts that are safe but would otherwise be scrapped. It also works to improve longevity, reliability and safety through parts rejection mode trending and component improvements. A predecessor to the current SAFR program called "Candidate for Disposal," in use during the Vietnam effort, impacted on readiness besides showing $20 million in savings. The program ended as a result of the post-Vietnam supply surge.

Parts Costs are Soaring

The demand for quality spare parts to support the depot maintenance, repair and overhaul effort is not decreasing; nor has the costs of parts declined. In fact, parts costs are spiraling. The old program has been reinstated with new twists and began working with the completion of the phase I building. A larger building, phase II, is in the works for fiscal year 1992. Savings from the new program are expected to offset the building cost at least five times in the first year of operation.

As inspection limits and repair procedures are developed here at DERSO, affected parts are reclassified. These parts are either consumed by the depot on maintenance programs or repaired on a component spares program and returned to the supply inventory for use at a later time.

- *Component improvement.* The SAFR program will provide valuable engineering insight on reject and discrepancy trends on high-value parts. In turn, these data will be used to identify and justify needed component improvements.
- *Rejection mode trending.* All parts wear out; however, most parts have a natural control that brings about the part to be removed from

Shown in this picture are SAFR parts in process at the new facility. On the right is Mr. Wesley J. Cass, SAFR project officer, with Mr. Jack Eads, a Dyncorp contract technician assigned to the facility.

the system before failure can occur. For example, an aluminum beer can, from a corrosion standpoint, will have a half-life of 1,000 years. It is usually discarded within its first year, long before it springs a leak from corrosion. Consumption of the beer early in the can's functional life is a natural control.

Contagious Blade Creep

Such a natural control exists on T53 engine power turbine blades, which experience creep during operation. This creep can be detected as blade stretch, which shows its advancement toward failure. During depot maintenance, the blade can be repeatedly tip-ground back to size and reused.

The natural control, in this case, is the minimum shroud thickness, allowed at the blade tip, which limits the creep that can occur before the blade must be changed out.

The identification and management of characteristics of critical flight safety parts are essential. The natural controls that remove flight safety parts from service before they can deteriorate and fail are essential as well. SAFR will follow trends, identify the rejection modes for flight safety parts and determine their adequacy as natural controls. Flight safety parts that do not have adequate controls must be assigned a finite operating life.

Current Events

Currently, over 12,000 parts have been processed into the new SAFR facility and are awaiting reclamation procedures. The potential VE savings from these items is more than $3 million. And, DERSO has yet to open the doors officially to a continual flow of SAFR parts from the CCAD overhaul shops. Typical examples of these items are as follows:

- Parts from the T700 engine used on the UH-60 Black Hawk and AH-64 Apache helicopters.
- Transmission and engine parts from the UH-1 Huey and AH-1G Cobra helicopters.
- T55 engine diffusers used on the CH-47D Chinook helicopter.

Team Effort

A team involving personnel of the Directorates for Maintenance, Engineering, Materiel Management and Product Assurance at both AVSCOM and CCAD—in addition to system project managers will follow trends and work toward preventing failures of flight safety parts.

AVIATION PERSONNEL NOTES

Order of Saint Michael

To recognize individuals who have contributed significantly to promoting Army Aviation, Major General Rudolph Ostovich III, the Aviation Branch chief, recently established the Order of Saint Michael. The order is a coordinated effort between the Army Aviation Association of America (AAAA) and the U.S. Army Aviation Center (USAAVNC). Recipients of the award must demonstrate the highest standards of integrity and moral character. They must display outstanding professional competence and serve with distinction.

The Bible refers to Saint Michael as an archangel who wages war against evil. Known as the heavenly prince or champion, he is charged specifically to guard and defend others. He is the legendary leader of angels who fought a war in heaven, conquered the dragon, and cast it down from the skies. Michael's battles are an allegory of the struggle between good and evil. Throughout the centuries, Michael has been depicted with a sword as he fights or stands over a conquered dragon.

Saint Michael exemplifies the bravery and gallantry that we associate with the aviation soldier. His angelic qualities demonstrate the boldness and swiftness of aviation on the battlefield. As a brave warrior and protector, Saint Michael is an appropriate symbol of excellence within Army Aviation.

The criteria for receipt of the Order of Saint Michael medallion are as follows:

- Demonstrate a significant conspicuous contribution to Army Aviation and support of the branch.
- Demonstrate the highest standards of integrity, moral character, professional competence and selflessness to duty.
- Be nominated for the award by an officer, enlisted soldier or civilian who is a member of AAAA.

Submit nominations through the local AAAA chapter. If there is no local chapter, send nominations directly to the National Executive Director, AAAA, 49 Richmondville Avenue, Westport, CT 06880-2000.

The approving authority for the Order of Saint Michael Award is the local AAAA chapter president; the AAAA national executive director; the AAAA awards committee; and the AAAA president, with final approval by the chief of Army Aviation.

Address questions to Commander, USAAVNC, ATZQ-AP-P (CPT Holt), Ft. Rucker, AL 36362-5036, AUTOVON 558-4313/5706 or Commercial 205-255-4313/5706.

Aviation Warrant Officer (AWO) Rank Coding

The U.S. Total Army Personnel Command (PERSCOM) has recently approved a revised rank coding table for AWOs. This initiative of the Aviation Personnel Proponency, Ft. Rucker provides a master warrant officer (MWO) aviator position at the aviation brigade level for each of the three AWO career tracks—safety, maintenance and operations/training. Nonrated maintenance MWO positions are provided at the aviation intermediate maintenance level.

Army Aviation Personnel Plan (A2P2)

The A2P2 is under revision. Aviation Personnel Proponency will publish the plan in December 1990. This revision will include the Army National Guard, the U.S. Army Reserve and the Active Component. This year's edition will also include civilian personnel proponency.

Flight Training Age Limit

Applicants for flight school still greatly exceed the number of aviators needed by the Aviation Branch. Remember, you cannot have reached your 30th birthday before starting flight school. For Warrant Officer Flight Training (WOFT) applicants, the U.S. Army Recruiting Command, Ft. Sheridan, IL, will not place your application before the WOFT selection board if you have already reached your 29th birthday.

Master Warrant Officer Training

Aviation warrant officers who desire to be considered for selection for master warrant must have completed either the old Warrant Officer Advanced or Senior Course, the new Senior Warrant Officer Training Course or have completed any of the previous courses by correspondence.

Military Occupational Specialties and Additional Skill Identifiers (ASIs)

I know you don't have a problem getting the right person, at the right time, at the right place, with the right training. During your umpteen years of service, you've always had the right person for the job. Whether it was a 68N, Avionic Mechanic with an additional skill identifier (ASI) of W5 (OH-58D) or a 67S, he or she was always on station to do the work for you. Well, if all that is true, you've had some mighty good luck riding with you. That, I assure you, is not the norm. Getting the right person, at the right time, with the right training, at the place you need him is a fine art of management that I've found lately to be very lacking in most commands. The people distribution system is very cumbersome when it comes to ASIs and demands the knowledge of the benefactor. To get what you want when you want it requires you to do certain things that if overlooked will probably get you someone close to the exact qualifications you desire but not exactly what you really need.

Now that is all very well and good, but it does not solve your dilemma, does it? Without writing a nine-page dissertation on the intricate how-tos, I am going to put it to you as simply and as best I can.

You lose someone and you need a replacement. Good start. Look at your table(s) of organization and equipment (TOE)/modified TOE (MTOE)/ table of distribution and allowances (TDA); what are you authorized? If it ain't there, don't ask for it! If it is indeed there, let's say a 68N, Avionic Mechanic, and you have OH-58D aircraft, then he needs to be W5 qualified. Your authorization document must reflect this ASI requirement. If not, you have a documentation problem. Not an easy fix sometimes. If a 68N20W5 is what you need, *make sure* that is what you ask for, or you may not get it.

Believe me, this is happening in each major Army command in the Army today. Make sure the chain of command, all the way to PERSCOM, gets the exact qualifications for the person you want. *Do not* let them drop the ASI requirement. But I will tell you that if your chain of command asks for a 68N, that's what you'll get. If that person just happens to have an ASI of W5 when his name comes up for reassignment and you get him, rejoice because this is your lucky day. Not everyone is that lucky. Make a visit to your personnel folks. Let them know your concerns about getting the right person at the right time and place you want him with the right training! Good luck. USAAVNC, ATTN: ATZQ-AP-P (SGM Morrill), Ft. Rucker, AL, 36362-5036.

TIs - TIs - TIs - TIs

Selecting the right technical inspectors (TIs) for the unit has been and always will be a prime concern of the field commander. The Army has taken a course of action to ensure the pool that you have to select from is larger in your unit. A commander should select quality soldiers who are best qualified based upon their experience and technical proficiency. The skill qualification identifier (SQI) "T" was intended to identify those soldiers who have either completed a military occupational specialty (MOS) 66 TI course or have

graduated from the new Basic Noncommissioned Officer Course which, as of 1 October 1989, incorporates TI training. He must also serve on valid unit orders as a TI for 12 months and be recommended by the company commander. The SQI was not intended to determine eligibility for the position of TI.

Commanders have expressed the need to choose their own TIs. The MOS 66 was done away with primarily to give back this authority, but commanders still believe they have been restricted on who should be TIs. So, a recommended change to AR 611-201, *Enlisted Career Management Fields and Military Occupational Specialties (Career Management Field 67, Aircraft Maintenance),* has been submitted for the deletion of the SQI "T." This change will basically delete para (t) in chapter 5 of AR 611-201. Watch for this change and also the standards of grade change in the corresponding tables of MOS.

In summary, the position reclassification of 66 series MOS was to be completed and rolled into the 67 series MOS in the January-March 1990 timeframe. Your TOE/MTOE/TDA documents today should *not* reflect any 66 series MOS. Second, the personnel reclassification (i.e., records, orders, Standard Installation/Division Personnel System occured in September 1990. Local personnel folks need to be aware of these changes to ensure we assign people to positions accordingly.

USAAVNC, ATTN: ATZQ-AP-P (SGM Morrill), Ft. Rucker, AL 36362-5036.

Aviation Commissioned Officer Branch Qualification

The principal objective of branch qualification is aviation commissioned officers become tactically and technically proficient during their company grade years of service. While not a requirement for branch qualification, service in different types of aviation units (attack, cavalry, assault or cargo) before field grade promotion is important. With this variety of experience, officers can attain the broad base of experience aviation leaders require.

Lieutenants must complete several items: demonstrate a mastery of precommissioning skills; successfully complete both an officer basic course and multitrack flight training; and serve in at least one aviation assignment. During this assignment, their gain of troop and flying experience as a section or platoon leader is desirable.

Captains attain branch qualification by completing an officer advanced course and serving in one of the following assignments:

- Successful company or detachment command.
- Successful platoon command where captains are authorized platoon leaders (15C, 15D, 15E and CH-47 units).
- Instructor or writer of aviation tactics or doctrine at the U.S. Army Aviation Center, the U.S. Army Aviation Logistics School or any other branch school. This also includes platoon trainers for the Aviation Officer Basic Course.
- Instructor pilot at U.S. Army Aviation Center or U.S. Army Aviation Logistics School. For more information, consult the Army Aviation Personnel Plan, Fall 1988 edition, or Department of the Army Pamphlet 600-3, *Commissioned Officer Professional Development and Utilization.*

Oath of Commissioning for Warrant Officers (WOs)

The law requires all permanent appointments to chief warrant officer grade be done by commission. All WOs are reminded that upon permanent promotion to chief warrant officer two, whether regular Army (RA) or U.S. Army Reserve, they must execute a DA Form 71, Oath of Office, for commissioning. WOs must complete the DA Form 71 by checking the proper box (RA or Reserve commissioned officer) in the upper left hand corner under the column for commissioned officers. Regular Army officers must also specify their branch, such as Aviation.

U.S. Army Reserve WOs need to execute the oath only once, but RA WOs must execute a new oath of office upon promotion to each permanent grade. Further, the oath must be executed upon changing component from USAR to RA, upon permanent promotion or appointment to a chief warrant officer grade. Individuals should mail the original copy of the DA 71 to Commander, PERSCOM, ATTN: TAPC-OPW-P, 200 Stovall Street, Alexandria, VA 22332-0420.

MINNESOTA RESERVISTS TRAIN IN ALASKA

Sergeant Gloria F. Burmester
Public Affairs Office
Headquarters, 88th Army Reserve Command
Fort Snelling, MN

THEY LEFT MINNESOTA in March to train in Alaska with long underwear, down coats, parkas, wool socks and even socks with batteries. Once they arrived, they were constantly warned to carry survival packs anytime they left the post, whether by land or air.

Alaska is not a land in which to be caught off guard by the fast-changing weather, according to members of the 4th Squadron, 9th Air Cavalry Regiment, Ft. Wainwright, AK.

Still, the Minnesota reservists were hard-pressed to find colder temperatures than the strong wind they fought at the Minnesota airport where they departed. They loaded the four AH-1 Cobras and one UH-1 Huey aboard an Air Force C-5A Galaxy as the wind created subzero temperatures. The

photo by SSG Terry R. Bluml

photo by SGT Gloria F. Burmester

ABOVE: At the Minneapolis-St. Paul International Airport, Cobras are ready for loading on the C-5A that will transport these helicopters and members of the 2/123d and 431st for 2 weeks of training in Alaska.

LEFT: The shadowy interior of the C-5A surrounds an AH-1 during unloading procedures.

C-5A with helicopters, baggage and personnel then flew to Alaska.

The 2d Battalion, 123d Aviation Regiment, and the 431st Aviation Intermediate Maintenance unit reservists are based at Holman Field, MN. Even with their memories of Minnesota, they could not understand why they should prepare for rapid changes of temperature in Alaska. During the 2-week annual training in Alaska, the daytime temperatures ranged from 40 to 60 degrees Fahrenheit. However, back in Minnesota and Wisconsin, their families suffered through some of the coldest wintertime temperatures.

The reservists arrived during "breakup," when snow began to melt and lake ice began to break apart. Several 2/123d aviators observed runners in

photo by SGT Gloria F. Burmester

As the sun slowly sinks below the Alaskan horizon, the reservists unload the Cobras from the C-5A.

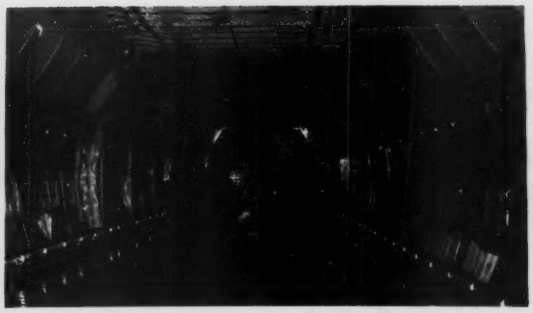


photo by SGT Gloria F. Burmester

The massive interior of the C-5A is almost empty as personnel unload the remaining "baggage."

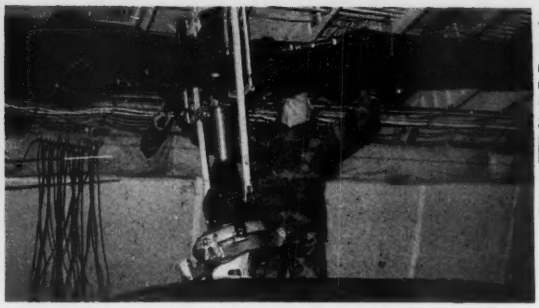


photo by SGT Gloria F. Burmester

SSG Kyle L. Anderson, a technician inspector with the 431st aviation intermediate maintenance (AVIM), carefully watches for clearance of the main rotor as the soldiers unload the Huey.

shorts and tank tops in the early morning as the sun rose over the horizon. They commented among themselves on the contrast of bicycles still buried in several feet of snow—while vehicles moved through melted snow that threatened to come through the floorboards. By the amount of snow still on the ground, they could well believe Alaska had indeed experienced the 77 inches of snow reported during the long winter months.

By the end of March when the Minnesota reservists arrived, the sun was adding 10 to 12 minutes of daylight each day. The northern lights flared and sunsets lasted 45 minutes. Unfortunately, the reservists didn't have time to notice much more.

Each day began either with classes, briefings, maintenance checks or catching more sleep, depending on individual roles. Of the 37 reservists

photo by SGT Gloria F. Burmeister

Members of the 2/123d Task Force prepare an AH-1 for movement to another section of the airfield.

who participated in the training, 15 were Cobra aviators and 22 were support personnel. Four units from the 2/123d and 431st units created the "2/123d Task Force." Army reserve aviation personnel did something new: train side-by-side, with their higher headquarters, in Cobra helicopters.

Aviators received several briefings on subjects such as safety procedures and unique things they needed to know about the area. They received a set of aerial maps for each helicopter and set about doing what they do best—flying.

Lieutenant Colonel Kenneth A. Sorensen, commander of the 2/123d, said the training was a deployment exercise to become combat ready. The aviators honed their skills in hiding and scrambling as well as in learning the complicated and specialized electronic capabilities of the Cobra. Several aviators flew Cobras during the Vietnam conflict. Chief Warrant Officer (CWO) C. Jack Hauck, an aviator assigned to Company A, 2/123d, said the Cobras he flew in Vietnam did not have the sophisticated electronic gear of the AH-1. So, even for veteran aviators, the exercise provided each aviator with the opportunity to know state-of-the-art equipment.

Twenty-two enlisted personnel and one warrant officer supported the aviators with their skills in mechanics, administrative requirements, electronics and weaponry. Without the enlisted personnel, the aviators would not have left the ground.

Each training day opened with a bustle of activity around hangar 2. Crewchiefs scrambled to ensure their helicopter was ready to go and then waited for the scrutinizing eyes of the aviator. The noncommissioned officers in charge performed administrative duties for each helicopter, resolved details, located parts and decided if a machine would or would not fly.

After the perfunctory checks by aviators, the Cobras left the airfield and arrived at the forward arming and refueling point. The technical inspectors, armament technicians, ammunition handlers, safety personnel and pad chiefs then took over.

Their jobs were "hurry-up and wait." While the Cobras waited on the ground, the crew rushed with the refueling and rearming. They loaded the Co-

photos by SGT Gloria F. Burmester

ABOVE: An AH-1 comes in for a landing at the forward arming and refueling point (FARP) amid the ash from a volcanic eruption.

RIGHT: As pilots take a break at the FARP, armament personnel prepare for the loading of training

photo by SGT Gloria F. Burmester

CW4s Arnie Lindner, veteran pilot, and Gregory L. Meyer, instructor pilot, 4/9 Cavalry, fly by the observation helicopter after their first round of firing.

bras with TOW missiles; 2.75-inch folding fin aerial/aircraft rockets; and 20mm cannon training rounds. Most of these were training rounds, but the crew also fired live high-explosive rockets.

Once the Cobras were off the ground, the ground crew had to wait for the Cobras to fire and return. The crew unpacked and readied the ammunition for loading; dug safety lines with the heels of their boots on the helicopter pads; and established a crude drainage system for a melt-off pond that caused many wet feet.

The second week of training added another factor into the training. In a joint Army and Air Force training exercise, the Air Force used A-10s.

During a wartime mission, the 4/9th Cavalry and 2/123d would support ground troops. The 4/9th Cavalry would identify targets and turn the firing mission over to the Cobras. The 4/9th Cavalry would also provide security and aerial escorts for the Cobras, said CWO Gregory L. Meyer of the 4/9th Cavalry. CWO Meyer said the 2/123d will be "...the most effective force of the 6th Infantry Division."

Wearing the long underwear, down coats, parkas and socks with batteries, the 2/123d portion of that force returned to Minnesota in April. Now the reservists have experiences and skills needed to train the 300 members left behind.

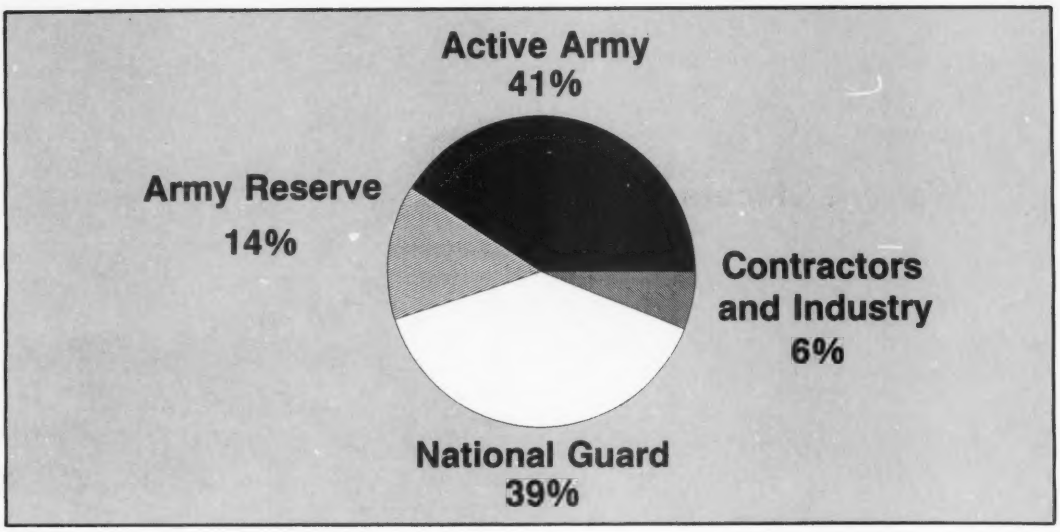


FIGURE 1: Army components represented.

THE 1990 MAINTENANCE TEST PILOT TRAINING UPDATE

Lieutenant Colonel Douglas A. Cahill
Director,
Directorate of Evaluation and Standardization
U.S. Army Aviation Logistics School
Fort Eustis, VA

Chief Warrant Officer, CW4, George S. Hrichak
Chief, Standardization and Analysis Division
Directorate of Evaluation and Standardization
U.S. Army Aviation Logistics School
Fort Eustis, VA

THE THIRD ANNUAL Worldwide Maintenance Test Pilot Standardization and Training Update was held in Williamsburg, VA, the last week of February 1990. The U.S. Army Aviation Logistics School (USAALS), Directorate of Evaluation and Standardization (DOES), Ft. Eustis, VA, served as the host. Two hundred and one Army maintenance managers and test pilots attended. Every Army component was represented, as well as Army contractors and representatives from the helicopter industry.

The annual training update prepares experienced maintenance test pilots to become maintenance test flight evaluators (MEs). The Army doesn't have a formal school to train MEs, so the USAALS, DOES, has taken the lead to provide a method of instruction to meet the needs of the Army's maintenance community.

The training update also presents the latest information available on maintenance standardization and aircrew training programs (ATPs). The DOES plans to continue hosting the training updates on an annual basis.

The keynote speaker for the week-long event was Major General Rudolph Ostovich III, commander, U.S. Army Aviation Center, Ft. Rucker, AL, and

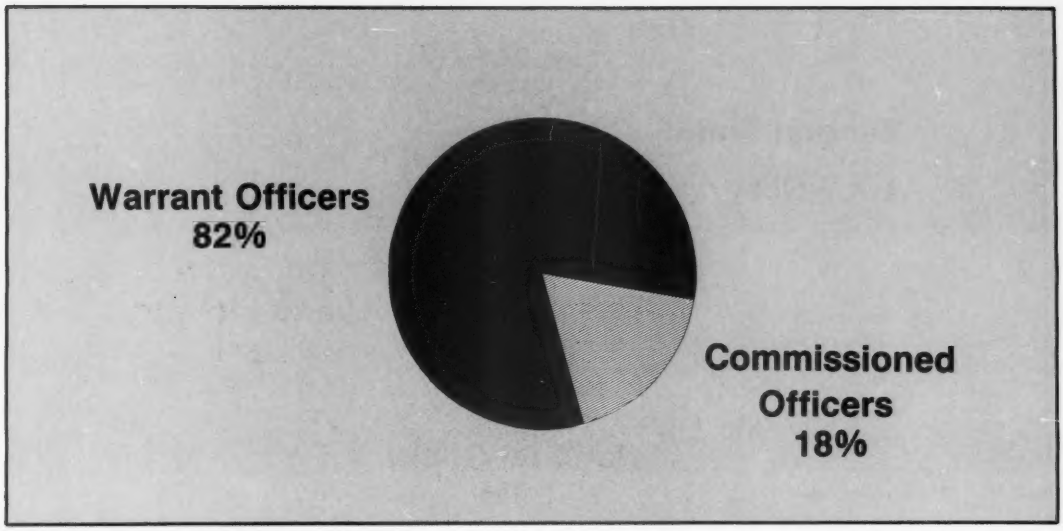


FIGURE 2: Officer analysis.

USAALS. In his presentation, General Ostovich addressed the role of the ME in the 1990s.

General Ostovich stated that commanders aren't "...sufficiently involved in the standardization program for the maintenance pilots. It is the responsibility of the unit ME to ensure his commander and standardization personnel understand the needs of the MP [maintenance test pilot] in the standardization program." He also recognized that MEs hold many additional major duties such as production control officers, quality control officers, shop officers or maintenance platoon leaders. "Being heavily tasked is the norm for you guys as an MP [maintenance test pilot] or ME. I appreciate the job you are doing in spite of the heavy load you carry. Aircraft maintenance drives the train...you can have the best trained pilot in the world, but if you can't load him up in an aircraft that is fully mission capable, all you really have is a poorly armed guard wearing a funny looking grey suit. I count on you guys to give our aviators an aircraft that functions as designed, and I thank you for your efforts to that end."

General Ostovich then discussed the standardization program. "The test pilot standardization program is an integral part of the aircrew training program. This must be emphasized to the standardization personnel in your units. Included in the ATP is the no-notice program. This is a most valuable tool to you and your commander. With it you can verify the experience, competency and proficiency of the test pilots and determine the effectiveness of your individual aircrew training program. A no-notice evaluation can consist of the demonstration of one maneuver, the performance of a preflight or encompass an entire general test flight. The only way you can determine if a test pilot is where he or she needs to be is to sample the population. So help your unit's efficiency, get out there and conduct no-notice evaluations at every opportunity. It will markedly improve your skills in this demanding business of evaluation and training. The byproduct of a more intensive no-notice program will be a more proficient maintenance test pilot community. We need this program more today than ever before because the new systems coming into our units are more complex and demanding both from a maintenance and standardization point of view.

"The Army is reshaping in light of the changing threat. While change is inevitable, I am committed to minimize the impact on Army Aviation. Nonetheless, the call to do more with less will only get louder. How well Army Aviation supports its

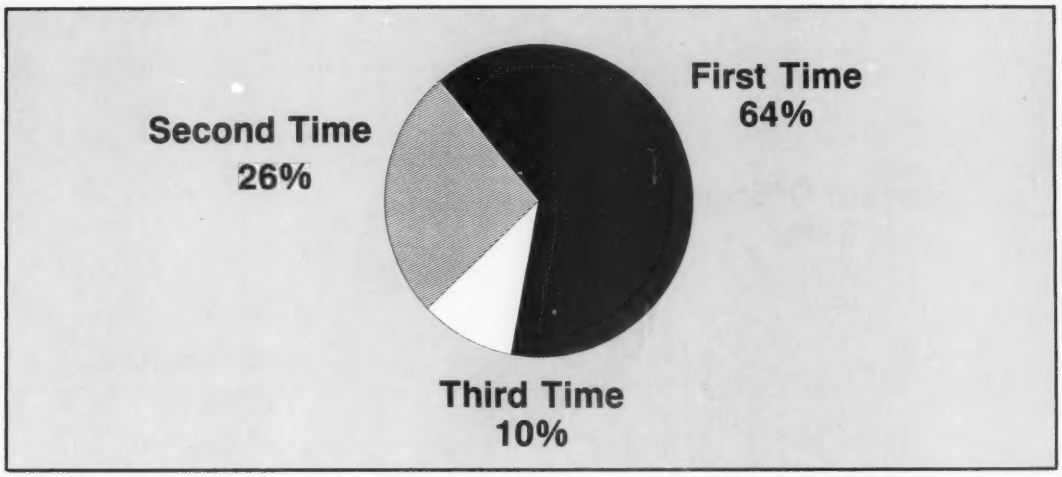


FIGURE 3: Previous attendees.

complex systems will in large measure depend on the quality of our maintenance test pilot program. Nothing can ever replace the experience and technical competence of an aviator who spends 20 or 30 years in this business of aircraft maintenance. The future of Army Aviation holds some awesome challenges. To succeed, we will need to exploit your technical and leadership abilities."

General Ostovich went on to focus on his areas of interest for 1990. The first being the no-notice standardization program that he already mentioned. The second was aircraft emergency procedures. He said, "Aviation Resource Management Survey [ARMS] results are showing that our pilots need to improve in this area. For the MP [maintenance test pilot] the challenge is much greater. In some cases MPs [maintenance test pilots] must test fly two to three different aircraft and must be proficient in emergency procedures in each. This is difficult at best. You must make emergency procedure training a major training issue in your standardization program. I want to ensure all pilots know the procedures and limitations of the aircraft they are flying. You can be certain the ARMS teams will be checking this for me."

The last point shared was his concern on the sound maintenance management procedures at unit level. "As I visit units, review ARMS results and discuss maintenance with commanders, I'm convinced we need to train our leadership better on the importance of maintenance management to the combat readiness of aviation units. You are the subject matter experts on maintenance, and as a graduate of the maintenance test pilot course you know procedures and how maintenance programs must be managed to ensure success. So renew your commitment to excellence and let's work together to improve in this vital area."

In closing, General Ostovich personally thanked everyone for his or her sacrifice and the excellent job being done in the maintenance field. He said collectively they were, "the standard setters for aviation maintenance and a vital resource to our Army."

Standardization instructor pilots and MEs from DOES also taught classes during this week. Those classes included the ATP, regulations and the fundamentals of instruction. Various directorates within the USAALS briefed issues of interest to the maintenance managers. Those issues included the Manpower Requirements Criteria System of table(s) of organization and equipment development, aircraft maintenance, officer job analysis and the 67A10 military occupational specialty, aviation apprentice mechanic. One complete day was devoted to workshops for each individual aircraft. During

*U.S. G.P.O. 1990-731-035;20004

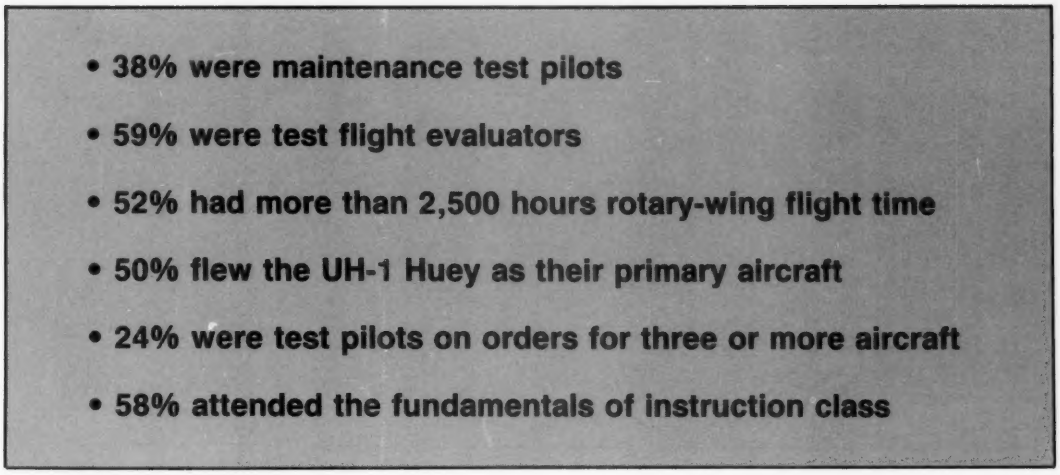

• 38% were maintenance test pilots
• 59% were test flight evaluators
• 52% had more than 2,500 hours rotary-wing flight time
• 50% flew the UH-1 Huey as their primary aircraft
• 24% were test pilots on orders for three or more aircraft
• 58% attended the fundamentals of instruction class

FIGURE 4: Survey of attendees.

these workshops, the instructors of the maintenance managers and maintenance test pilot course went over the procedures in Field Manual 1-544, *Standardized Maintenance Test Flight Procedures*, and addressed problems that were brought up.

Mr. Joseph Cribbins, Special Assistant to the Deputy Chief of Staff for Logistics, gave the opening remarks for the industry day presentation. He presented an overview of Army Aviation plus some humorous insights into operations at the Department of Defense. Next, Mr. Robert Hubbard, Deputy Project Manager for the Light Helicopter (LH) program, gave a briefing on the T-800 turbine engine and introduced the two LH team speakers. They gave some insight into how the LH is being developed with the maintenance personnel in mind. Mr. Nick Lappos, chief project pilot for Sikorsky Aircraft, delivered the closing remarks for the industry day presentation. He gave what turned out to be everyone's favorite class on "Aircraft Limitations...Where They Come From and Why."

The U.S. Army Aviation Systems Command, St. Louis, MO, sent representatives who discussed Army Regulation 95-20, *Contractor's Flight Operations*; advanced diagnostics and the maintenance test pilot; quality deficiency reports; equipment improvement reports; and Department of the Army Pamphlet 735-761, *Functional Users Manual for the Army Maintenance Management System-Aviation*.

A survey was taken of the 201 attendees at this year's update event and statistics were compiled. The Army components represented, and the experience of the attendees are shown in figures 1 through 4.

The annual training update is a valuable tool commanders should use to improve their maintenance posture and maintenance test pilot standardization program. The next update is planned for the second quarter of fiscal year (FY) 1991. Colonel Thomas Walker, USAALS assistant commandant, and Lieutenant Colonel Douglas Cahill, director, DOES, strongly urge commanders to program temporary duty funds into their FY 1991 budget so that their maintenance personnel can attend the next Worldwide Maintenance Test Pilot Training Update.

If you have any questions regarding the update please call the USAALS, DOES, HOTLINE at AUTOVON 927-6166 or Commercial 804-878-6166. Calls received after normal duty hours will be recorded and answered the next duty day. The DOES also solicits comments on the quality of the USAALS training and its graduates, plus any test flight or maintenance-related issues.

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U.S. Army Aeronautical Services Office

DOD Flight Information Publication (FLIP) Product Changes

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THE DEPARTMENT of Defense (DOD) FLIP terminal and related products will undergo numerous format and publication cycle changes throughout the remainder of calendar year 1990. These changes will result in some adjustments in automatic initial distribution of FLIPs to units.

The Defense Mapping Agency Combat Support Center, Washington, DC, will adjust your accounts automatically to reflect these realignments. All changes will be made to ensure that distribution quantities and requirements of current FLIPs will subsequently be provided for new and/or replacement products. However, this could result in either a slight over- or under-distribution of any of these products. Each unit will wait until they receive the initial distribution of the new products before making account adjustments required to support operational requirements.

• *Discontinuance of wall planning charts.* The final edition of the U.S. instrument flight rules (IFR) wall planning chart set, the U.S. high altitude wall planning chart and the U.S. visual flight rules/IFR wall planning chart was 28 June 1990. The Europe, North Africa and Middle East wall planning charts were discontinued on 26 July 1990.

• *U.S. terminal low select instrument approach procedures (IAPs).* The final issue of U.S. select terminal volumes A through E was 20 September 1990. These approaches are already carried in the U.S. IAPs.

• *Standard instrument departures (SIDs) and standard arrival routes (STARs).* Effective 13 December 1990, DOD will publish combined U.S. civil SID and STAR East and West books (on a 56-day cycle) instead of purchasing the National Ocean Service (NOS) SIDs and STARs. U.S. military SIDs will be published in the U.S. low IAPs.

• *NOS terminals realignment and title change.* Effective 13 December 1990, NOS will retitle their IAP books as U.S. terminal procedure publications and will make the following product realignments:

☐ New Mexico will move from South Central volume 2 to Southwest volume 1.

☐ Texas will remain as the only state in South Central volume 2.

☐ California will be published separately as a new Southwest volume 2.

• *Publication cycle shift.* The publication cycles of the affected products will shift as follows:

☐ New terminal U.S. low IAPs volumes 1 through 12 effective dates will be 13 December 1990, 7 February 1991, 4 April 1991, 30 May 1991, etc. The 20 September 1990 issue of U.S. low IAPs is valid for 84 days with an extra terminal change notice (TCN) dated 15 November 1990.

☐ New terminal U.S. low IAPs TCN effective dates will be 10 January 1991, 7 March 1991, 2 May 1991, etc.

☐ New terminal SIDSTAR East and SIDSTAR West effective dates will be 13 December 1990, 7 February 1991, 4 April 1991, 30 May 1991, etc.

☐ New terminal SIDSTAR TCN effective dates will be 10 January 1991, 7 February 1991, 2 May 1991, etc.

☐ New U.S. terminal procedure publications dates will be 13 December 1990, 7 February 1991, 4 April 1991, 30 May 1991, etc. NOS will also publish two TCNs with the 20 September 1990 edition during product realignment.